ELECTRICAL REVIEW

[ILLUSTRATED.]

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Hess Electric Guest Call and Fire Alarm.

The Standard Electrical Works of Cincinnati, have scored another great achievement for electricity in the Hess System Guest Call, Fire Alarm and Gravity Drop Annunciator. By means of this system, the office of every hotel is put in immediate connection with every room in the hotel, and in case of fire an instantaneous alarm is given to every guest in the hotel.

Fully covered by good patents and already in use in a large number of hotels, aggregating over two thousand rooms, it can almost be said to be the standard system for hotels.

The Guest Call, Fire Alarm and Annunciator is gotten up in handsome case, an ornament to every office, and all mechanism is finished in best workmanlike manner. In each room is a finely finished bell and push-button. If a clerk wishes to ascertain if the guest is in his room, he presses the button in the lower part of the case, corresponding to the number of the room, this rings the bell in the room, which the guest answers by pressing push-button in his room, which lets fall a drop on annunciator in upper part of the case, and at the same time rings the bell.

In case of fire or other danger, the clerk, by moving the lever in th lower left-hand corner of case, immediately starts every bell in the house to vigorously ringing, and can in the space of three seconds arouse every one in the hotel.

In general, clerks have to arouse guests by complicated clock-work, arousing one guest at a time, commencing at a definite point and going around in rotation, so that while guests down on first floor are being aroused those on the fifth floor, where most danger is, are not alarmed until the last. The Hess Call is particularly valuable for this reason, and will undoubtedly be in large demand as soon as hotel proprietors become acquainted with it. One style is illustrated on this page. The Review congratulates the Standard Company on this new apparatus, not only for its convenience and aid to prompt service, but for the great value it undoubtedly is in arousing sleeping guests and saving lives from destruction by fire.

Experiments with Accumulators.

Messrs. Crova & Garbe have been making some instructive experiments as to the regulation of the charge and discharge of accumulators, the results of which were presented by M. Faye recently to the Academy of Sciences of Paris, a report of which will be found in the *Revue Internationale de l'Electricité* for August. From the premises given in detail, these distinguished investigators arrived at the following conclusions:

"That the disengagement of gas is not an index of saturation, it is a cause of loss of energy and of the destruction of the layer of active material which appears the sooner according as the charging current is the more powerful. The greater the rapidity of discharge the greater the diminution of the capacity practically utilizable. Consecutive chemical work with interruption produces no practically useful effect over a uniform discharge for the effect produced, energetic at the moment of closing the circuit, decreases rapidly and exhausts itself nearly as soon.

"Thick layers of active material are useful only when the discharge per unit of surface is sufficiently small, about 0.1 ampere per decimeter square of active surface—it is, therefore, advantageous in the case of an intense discharge to increase the surface of the plates and to work with a thickness of layers of material relatively slight, the limit to which we can augment this thickness depending upon the discharge per unit of surface of plates and probably also the constitution of the active layers varied with the mode of construction and formation."

These points are new, and add materially to our knowledge of the best methods of construction and operation of accumulators for different purposes.

The Hess Call System of the Standard Electrical Works.

A Lesson in Electrical Railway Building.

The construction and successful operation of another electrical railway in Great Britain similar, in many respects, to that which has been in active operation at Portrush, Ireland, for several years, furnishes another proof of the practical utility of the electro-motor for certain work. On the other side of the water they seem to have more practical success with the electric-railway problem than we do here, though they get all their ideas of electro-motor construction from America. Perhaps a reason for their success in this line is to be found in the adherence of the European engineer to what can be readily accomplished rather than groping forward among the possibilities. Our electro-motor people lend themselves, for the most part, to discounting the future of electric railroading instead of devoting themselves to building short lines in the suburbs of large cities, where an occasional breakdown would be of trifling moment; they would introduce their motors immediately upon a crowded way, like the elevated railroad of New York city, where 400,000 persons must be carried in a day; where a stop of ten or fifteen minutes delays thousands of people, and a delay of an hour is of more consequence in business hours than an eclipse of the moon.

They haven't succeeded in operating any elevated railroads by electricity yet, and are not likely to do so for many a day. But they have succeeded by a continual failure to carry out their promises and pledges, in shaking the confidence of the public in the electro-motor. And yet, short lines of road can be, and are, at this moment operated by electricity, and there is the best reason to believe that in the future electricity will go far in usurping the place now occupied by steam, because electricity is peculiarly adapted to motors.

The new electric railway in Great Britain is at Bessbrook, and as it was not thrown open for public inspection until it was completed and in good running order and working smoothly, it has made a favorable impression upon the public, and its successful operation is likely to lead to the construction of many more similar roads. An account of this road says:

"The Bessbrook Spinning Company, owning very extensive mills and granite quarries at Bessbrook, has hitherto been obliged to cart all coals, goods, and stores from the wharves and railway stations, at Newry, a distance of three miles. This traffic, including that incident to the village of Bessbrook, amounts so about 28,000 tons annually, and much inconvenience has been felt from having no better method of conveying it than ordinary carts. The directors of the company have for some time had in contemplation the establishment of a tramway between Newry and Bessbrook, but the great obstacle to the carrying out of this has been the difficulty which would be encountered at both ends by the trans-shipment of the goods being necessary, as there were difficulties in carrying the tramway at the one end to the railway stations, and at the other to the various departments of the mills. These difficulties have now been entirely overcome by a modification of the usual wagon. The wagons are constructed with wheels having no flanges, and of sufficient width of tire, 2½ inches, to allow them to run upon the ordinary roads of the country. The front part of the wagon is carried on a bogie, which can either be pinned so as to make a fixed wheel base, or can be allowed freedom of movement as in an ordinary road vehicle. To the fore bogie horse-shafts can be attached for use on the roads. The wagons will carry a maximum load of two tons each, which, except upon very steep gradients, an ordinary horse can draw on the country roads. On the outside of the ordinary tramway rails, second rails have been laid of a lighter section, to which the ordinary rails act as a guard. The flangeless wheels run upon these outside rails, and their motion is restricted by the inside rails."

No steam is used on this line whatever. The dynamos are operated by means of the power collected from a waterfall. The column of water is made to strike upon a turbine wheel, which developes 65 horse-power, and the power thus generated is transmitted to the first machine.

There are six cars in each tram, each of these, under ordinary circumstances, carrying two tons, but the train having a maximum capacity of 26 tons. Thirty-four passengers may be carried. There are inclines of as much as one in fifty. The trains move now at an average rate of about fifteen miles an hour, but this speed can, when the apparatus is perfected, be increased very much.

The electrical conductor consists of an inserted steel channel carried on insulators fixed midway between the rails.

The Work of the Electrical Subway Commission.

Hon. Theo. Moss, secretary and treasurer of the New York Electrical Subway Commission, in a recent interview, gives the following, concerning the work that has been done up to the present: "We were named under the act of June 13, 1885, which amended and took the place of the law of June 14, 1884. The former had in the provisions that the streets should be cleared of poles and overhead wires on or before November 1, 1885, but the law of 1885 provided for a much more temperate way of reaching a very desirable result. The law, you know, makes it the duty of the authorities of the large cities of the State to name the Commissioners. We were so named in this city, and have been hard at work ever since. We gave the companies already in existence notice to present plans. The law gave them sixty days in which to do it. At the end of that time, if they failed to present us with a satisfactory scheme, then we were to look into the subject ourselves. We did so, inviting those interested to submit plans, and there are now upward of a hundred plans at our room in Twenty-third street, making, I can assure you, a veritable museum of electrical contrivances. We seemed to have everything possible on the subject pushed upon our notice, and now we are busy making a catalogue of the schemes. The Commissioners will then take a visit to Chicago, Washington, Philadelphia, and other cities where something of the sort we are after has been put in practice, and then we shall settle down with such experts as we shall call in, to sift out the best and most feasible scheme. It is a tremendous job, I can assure you, but we will be ready for our travels in a few days, and by next spring we hope to have something to submit, so that during next summer the plans may be put into actual operation. We have had every encouragement, not only from the public, but from the companies themselves, who are anxious to have the underground plan carried out, as a matter of economy in the long run. Having fixed on a plan, the law under which we act gives us full authority to compel its adoption by all who use or wish to use the streets for carrying electric wires of any kind. We are not bound to any time in which to reach a conclusion, but we are working on with due diligence, and I do not think a single day has been wasted since we started in. If by a year from this time the streets are comparatively clear of the wire nuisance, I think the public will be satisfied that we have not fritted away our time. Since we came into control, no permits for the erection of poles have been granted, though we have had many applications. One concern, you will remember, having sold their works on the site of the Grand Central Depot extension, were very anxious to carry their wire to a new shop, but their request to put up new poles was refused. I understand that they strung wires on old poles over a round-about route."

About the Zipernowsky-Deri System of Distributing Electricity.

Editors Electrical Review:

We have read with much pleasure in the issue of the 3d instant of your esteemed journal, some statements about our system of transformers, invented by our engineers, Messrs. Zipernowsky and Deri; but we would request you to accord us some of your valuable space, in order to make a few remarks with reference to some of these statements.

Firstly, we beg to remark that our system in question is by no means an imitation of the Gaulard and Gibbs system. The only common feature of this latter system and ours consists in the use of alternate currents and the inductional properties of these, but therewith the similarity ends, as Mr. E. Hospitalier has already observed in No. 123 of *L'Electricité*. Our dynamo—its regulation, the form and the construction of our transformer, the mode of connecting up the parts of the system—are all quite different to theirs, and designed with the distinct view to insure absolute independence of the individual lamps.

The Zipernowsky-Deri system of distributing electricity by means of transformers, as you very correctly remark, is acting as a compound system, and is based on the connection in parallel arc, not only of the transformers in the primary circuit, but also of the lamps, etc., in the secondary circuits. But you further refer to M. Uzel's experiments at Turin as having shown that within wide limits the difference of potential at the terminals of the secondary circuit increases with the increase of resistance of the secondary circuit, and thence you conclude that an arrangement in series would be more easily worked out, and that such an arrangement would be more easily made self-regulating. Now, the variability of potential at the terminals of the secondary circuit has been shown by M. Uzel's experiments, which were based *on the constancy of the intensity* of current *in the primary circuit*. But if, in the primary circuit, the potential (instead of the intensity) remains constant, the difference of potential at the terminals of the secondary circuit will equally remain constant, even if the secondary resistances be considerably variable, and this constancy will be maintained under much wider limits, and much more completely, than the regularity of the intensity in the secondary circuit, as shown in the tables of M. Uzel. With apparatus of so good construction and efficiency as our transformers, the constancy in the difference of potential at the terminals of the secondary circuit is obtained with nearly absolute accuracy, even within the widest limits.

There now arises the question, whether it is more advisable to arrange the lamps, especially incandescent lamps, in the secondary circuit in series or in parallel arc? But we think practical experience has already definitely decided in favor of the latter system; and we may, perhaps, add that, had there been used another mode of connecting the lamps than in parallel arc, incandescent lighting would have never reached that popularity and general application as belongs to it to-day, and it will, no doubt, be quite superfluous to enumerate the many advantages of this mode of connection for incandescent lamps—*vis a-vis*, the series arrangement.

But if the lamps are connected in parallel arc in the secondary circuits, it would be extremely difficult, yet within wide limits of variability—it would even be quite impossible—to maintain the series arrangement of the transformers, on which arrangement the Gaulard and Gibbs system is based.

You are very right in saying that a system of so much importance requires an extended experience before it is possible to define its status; but we beg to remark, that extended experience has already been gained, as our system has been working for more than three months at the Antwerp Exhibition and at the Inventions Exhibition at London, and for nearly six months at the General Exhibition of Budapest, where ten several pavilions and dining-rooms are daily lighted by incandescent lamps, at a distance of 1,300 meters from the central station; and we may add that these extended experiences have proved the high efficiency and practical applicability of our new system of distributing electricity by aid of transformers.

We remain, yours faithfully,

GANZ & Co.

Buda-Pesth, Hungary, 19th October, 1885

Electric Lighting in Portland, Me.

The Portland *Advertiser* has the following description of the incandescent system now being installed for the city by the American Electric Manufacturing Company. The *Advertiser* says:

The introduction of the "Municipal System" of incandescent electric lamps to take the place of gas and naphtha wherever our streets are not to be illuminated by the arc light, has occasioned a great deal of comment, both in favor of and against the method. Several interruptions in the working of the new lights have occurred, and these in some cases on dark and stormy nights, making the absence of the usual gas jets and naphtha lamps more noticeable, and causing many expressions of distrust and impatience. The change from the old to the new method has also progressed much more slowly than was expected.

On the other hand, the electric system when working properly, has shown itself a steady and attractive light, and the increase in the volume of illumination in many localities has been the means of making for the coming plan warm friends.

With a view of answering some of the queries suggested, and learning the cause of the interruptions and delays which have taken place, a reporter of the *Advertiser* called yesterday at the electric light company's office, and was introduced by Manager Sawyer to Mr. W. J. Jenks, of New York, the electrical engineer of the American Electric Manufacturing Company, by whom this portion of the work has been directed. Mr. Jenks was found to be desirous of explaining the practical workings of the new system, and making clear the causes of the somewhat erratic action of the lamps thus far placed.

"What is the difference between the general plan of the 'municipal' system and that of the arc lamps with which we are familiar?"

"The pressure or force of the current is nearly the same, in both cases. Either of the dynamos will give a severe shock if carelessly handled. But the volume or quantity of the current sent over an arc circuit is about three times as great as on the incandescent lines. So while we run only one circuit from an arc-light machine, we divide the current of the other into several parts. The dynamos used here will furnish the electricity for ten circuits, each circuit having twenty incandescent lamps of thirty-two candle-power, or forty lamps of sixteen candles, or a mixture of both, the total light-giving capacity of each circuit being 640 candles. The high pressure of the current enables us to distribute this relatively small volume of current to as great a distance from the station as can be covered by the large lights, with a smaller wire, the size most used being from one-quarter to one-third the size or mass of the arc-light conductors. Our circuits will vary from one to five miles in length."

"One question as we pass this point: I suppose the loss you sustain in sending this current over long wires can be calculated?"

"Certainly; and with much greater exactness than the loss in a system of water, gas or steam distribution. This is one of the vital questions in our business, for we are simply selling distributed power in the form of light. Our first care is to get the most energy we can out of a pile of coal at the least expense; and then to distribute that energy in the form of electricity so as to lose as little as possible on the way and realize all the light we can at the other end of the line, consistently with a good distribution."

"What is the difference in the power required to run the arc and incandescent lamps?"

"Each arc light requires, roughly, about one-horse power of mechanical energy. With this same outlay we secure about four 32-candle lamps, or eight 16-candles, on the incandescent system. Of course the subdivision is a source of loss in quantity of light developed, but we gain a valuable advantage in distributing a number of small lamps in densely shaded, or thinly settled districts, so as to give better general effect. Then the expense of the incandescent lamps is less than the carbons for the arc system, so that we are able to give a little advantage in this respect."

"What has been the cause of the uncertain action of your first circuits?"

"This is the first system of this kind where the hoods which hold the lamps have ever been put on iron posts, which has been done here to avoid the multiplicity of poles in the streets. Placed on wooden poles, the tendency of this high-pressure current to escape to the ground is greatly less than under the conditions here, and so after we had equipped two or three circuits, we found that the hoods were not made with sufficient insulation to prevent a strong leakage. This in two or three days disabled a number of our lamps and obliged us to make and attach a device which has effectually shielded us from further trouble of this kind. The small boys speedily found that while this leakage took place they could get a shock by touching the iron posts, and enjoyed the sport hugely for a few days, while we were at work constructing these insulators and applying them to all the circuits in operation."

"Have you had any other difficulties?"

"None whatever, excepting from the contact of other wires which have fallen upon ours. Such accidents are of course likely to occur with any overhead system, and where the covering of the wires rubs off by swinging in the wind, and the metal of the two circuits comes in contact, our lights may be interrupted on the particular circuit affected until they can be separated. With care and frequent inspection on our part, and by the telegraph, telephone, fire-alarm and district messenger people, these accidents will be rare."

"How long do these lamps last, and how do you know when they go out?"

"Tests thus far made at the lamp factory, and at Lockport, New York, where the system has been in operation for several months, as well as our own experience here, point to a very long life, probably from 1,200 to 2,000 hours of actual burning, or from five to eight months at the rate of eight hours a day. During the long nights of winter they will of course have to be renewed oftener. When one burns out, an automatic device in the hood cuts it out of the circuit completely, allowing the others to burn as before. At the same time an indicator in the station shows that a lamp has given out, and a boy is sent to replace it."

"Is this system also desirable for interior lighting, for instance, in stores and dwelling? I see you have it in the City Hall and the City Treasurer's office."

"The Municipal is not intended for general inside work. It is perfectly safe for that purpose when the wiring is done by the same methods used in the arc system. But in stores and houses it is very desirable that each lamp may be separately turned on or off, and that the current may be measured by an electric meter, if desired. We have a system, as I have no doubt you know, which is in successful operation in New York, Lawrence, Brockton and Fall River, Mass., Harrisburg, Pa., and about twenty other cities and towns through the country. The current employed in this plan, which is known as the three-wire system, is of such low pressure as to be perfectly harmless in its effects on the human system. If the experiments in the City Hall and elsewhere result in showing a general desire for this store and residence system, it will be forthcoming, I have no doubt."

"One question more as to the street lamps; are you satisfied with the effect produced by these hoods you have used thus far?"

"No, we are not, and as you may have noticed, we have tried a few experiments on some heavily shaded streets with two or three other styles. We have now nearly a dozen forms of opaque, translucent and transparent hoods, shades and globes, and shall within a few days decide on what our tests show to be most efficient and make a general plan for the remainder of our work. This is the principal reason of our delay in pushing the work to completion. The changes to be made on those now running will not cause any interruption of the service. We shall use every possible means to make this Portland plant a model one of its kind, and spare no pains to give your people not only a reliable but a well diffused and satisfactory light. One thing should be remembered by everybody—it does not follow that because these lamps now being scattered broadcast through the city are electric lamps that each one must be expected to give a dazzling glare. Many people are apparently looking for some such result. The city authorities who contracted for the system do not look for it and would not pay for it But the mild, mellow, perfectly steady glow of the incandescent lamp will, I am confident, win its way to public approval as we complete our work. The lighting of the city, and the extinguishing of the lamps with the coming of the morning twilight will be done from the station, and instantly. In case of stormy weather no district will be left in darkness for the time necessary for a lighter to complete his rounds."

"Triple Contact" Bell.

The cut herewith shows the new "Triple Contact" electric bell of E. S. Greeley & Co., of this city. The bell is provided with triple contact points, thus assuring, in a measure, the security of the back contact, on which the continuity of the circuit depends. It distributes the sparking over several times the usual area and reduces that much the danger of burning under heavy

battery. The armature is pivoted, and so offers the greatest freedom of action. The contact adjustment is particularly effective and convenient, and deemed of sufficient value to be patented. The tension spring adjustment is also a special feature. The bell will ring well on a single cell.

* * An ingenious form of insulating stem for experiments in static electricity has been devised by M. Fonviele. He uses a hollow rod of glass, and inserts a spiral of platinum wire, which, being rendered incandescent by means of a small bichromate battery, heats the stem and keeps it dry—thus insuring perfect insulation.

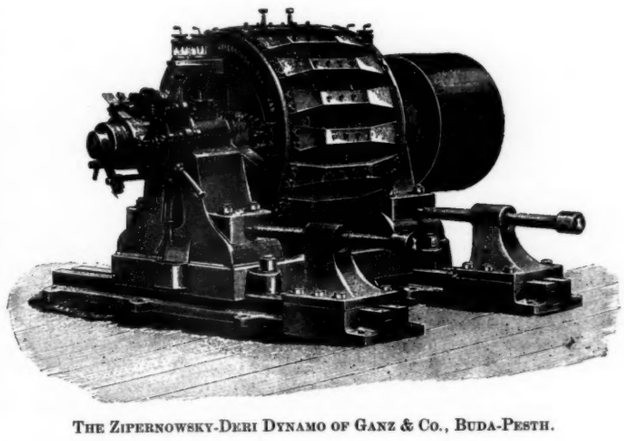
* * In the Smithsonian Institution at Washington, is a small nugget of gold, a little larger than a pea, that first met the eyes of James Marshall in the saw-mill raceway at Sacramento, and was the beginning of those discoveries in California that have added nearly $1,500,000,000 in gold to the world's stock of the precious metals.

* * From experiments performed by Prof. Bauschinger, of Munich, it was found that of all the materials used in columns for supporting portions of buildings, cast iron and cement-concrete best endured the test of great heat, as in fires and sudden cooling with water. Wrought-iron columns failed much more quickly. Brick pillars showed great resistance, but granite, limestone and sandstone were not fireproof.

The Post Office and the Telephone.

"From America (says the Glasgow *News*) we have received many things of every-day use. Not to hark back so far as the introduction of the succulent potato or the consoling tobacco leaf, nor to dilate upon such doubtful benefits as coupon watches and alarum clocks which ring at the wrong hour, we of this generation have to thank our American cousins for the sewing machine, whose click is heard in every household, and the telephone, whose impatient summons is as saving of our time as it is wasteful of our temper. Perhaps it is a remembrance of this last qualification, with a delicate consideration for the nerves of the race, which has prompted the Postmaster-General to set his foot upon the telephone as firmly as if it were the Colorado beetle; and now we await with some interest the coming discussion on the Postal Telegraph vote, when we may hope to see if our charitable surmise is correct. Meanwhile the telephone continues to exist, and even to spread, although at a very different rate of growth than would be the case if Mr. Fawcett's heavy foot were removed, and free facility given to the natural progress of the invention. At present the use of the telephone in Britain is very limited. In the United States there are several large towns in which there is one telephone for every 125 inhabitants, and in many places the proportion is one in 200, or thereby. In this country these figures are not even approached. Again, we find that in Stockholm, and we believe in other towns in Sweden and Norway, a system of penny telephonic messages is in active and successful operation. As befits the habits of these Northern countries, the method of working is simple in the extreme. The company has instruments fitted up in all the chief cigar shops. The shopkeeper has by him the usual subscribers' list, and anyone, townsman or stranger, can go into these shops, be connected with any subscriber, and talk for five minutes on payment of one penny. The London companies were even prepared to go further than this, and to try the experiment of delivering these penny messages to persons not on the exchange, but to this, like all other proposals to cheapen and popularize the telephone system, the Post-office has hitherto given a simple refusal. Free trade may be the Cabinet's craze when it deals with other folk's corn, but unbending protection is its practice when you treat of its own monopolies. In considering this matter it should be clearly understood that the controlling position obtained by the Post-office is founded on a legal quibble, and that, in place of being sanctioned, it has been disapproved of by Parliament. When in 1878 the present Postmaster introduced into his Telegraph Bill a clause for the purpose of controlling the then merely talked-of telephone, the House of Commons promptly struck it out. And when, two years later, the Post-office obtained from the High Court of Justice a decision that the telephone was a telegraph within the meaning of the Act of 1869, the verdict came as a surprise to everyone. It is an interesting point of ethics to consider whether one minister who prates of 'the unholy horrors of war,' another who discourses on 'the righteousness which exalteth a nation,' and a third who says, 'Let us be just though the heavens fall,' are morally entitled to take advantage—monetary advantage—of a decision which everybody admits to be founded on a Parliamentary draughtsman's looseness of phrase, or to use this legal decision in despite of the expressed opinion of the people's representatives for the purposes of swaddling in Government red tape an invention of which Sir William Thomson says: 'When the telegraph Acts were passed the telephone had not been invented, and no one concerned in that legislation had the slightest idea that it would be possible so to extend the powers of speech as to enable persons at a distance to converse with each other,' and to which Prof. Tyndall adds that 'to confound the telephone with the telegraph would be to place in the same catalogue utterly dissimilar things.' If it had been some Tory postmaster who had dared to impose such a tax on inter-communication without the authority of the House, and even against its vote, the country would have rung with fiery denunciations of the unconstitutional abuse, and any agricultural laborer who wanted a holiday would have been free to demonstrate in London at some unknown person's expense. But the Postmaster is a Liberal who is losing money in an over-hasty attempt to crush a few private carriers, and the case being altered alters the case. The manner in which the Post-office has used these legal powers so acquired is petty and vexatious in the extreme. Apart from the broad question of the policy of demanding from the companies the heavy royalty of 10 per cent. of their gross receipts, the postal authorities have chosen needlessly to interfere in the details of the telephonic business, and always in such a way as to prevent the cheap and economical working of the system. Thus the department demands that each company shall have a separate license for each town; it fixes an arbitrary limit to the radius of the wires; it will not permit the officials of the companies to execute commissions of any kind for the subscribers; it will not allow of call-offices, such as exist in Stockholm, on any terms; it uses certain press clauses of the Telegraph Acts to boycott clubs which use telephonic communication; it fixes an admittedly prohibitory price for trunk wires from town to town; it allows subscribers to its own exchanges to telephone telegraph messages to local post offices, and refuses the same permission to the companies' subscribers; and finally, it seems to take several months to consider any application for a license, and then it usually refuses consent. Thus, out of 77 applications made since the department revised its terms, it has granted eight. This the Postmaster calls granting 'the greatest freedom possible, compatible with due protection of the interest of the revenue.'

"We fail to see that revenue requires any protection from the prosecution of an invention which has never been declared a source of revenue, and which no Chancellor of the Exchequer would ever openly seek to tax. All taxes on intercommunication are radically bad. There is no more reason why we should tax a man for speaking through a telephone than speaking through a speaking-tube, or for sending the same message by hand or letter; and the action of the Post-Office in this matter has in effect proved a restraint on public liberty, and a hindrance to the public weal. Economically the tax is absolutely indefensible, and the more so as it is one of those specially vicious imposts which, like the old tax on windows, raised a comparatively small revenue at an enormous indirect cost to the people. By the dog-in-the-manger policy of the much-lauded Professor of Political Economy who presides at St. Martin's-le-Grand, nearly a thousand of the merchants of Glasgow are at present paying twenty pounds a year for telephonic communication, with, which free, unfettered and unlicensed competition, and the numerous inventions which follow in its train, they might well have had for half the money, and there are several thousand men of all grades who would eagerly use the telephone at a moderate price. In short, in Glasgow alone the community loses by the action of the Post-Office a greater sum each year than the whole revenue—some fifteen thousand pounds—which the department derives from its oppressive demands. But even if the ministers who would in theory 'be just though the heavens fall' cannot see their way to practice what they preach, when for 'heavens' we substitute a trifling sum of money, there is a mid course which should be insisted on pending their conversion to sound economical—not to say righteous—doctrine. The companies have two alternative proposals to make. In the first they ask to be freed from royalties, and offer to pay to the department any sum which it may be supposed to have lost if the ordinary telegraphic business of any district where telephones are at work does not increase in the future in as large a ratio as in the past. In the second they propose, while dissenting from the principle of any tax upon their energies, to give a 5 per cent. royalty, and to come under the same obligation as in the first offer. But in both of these offers they lay stress upon freedom from vexatious interference, believing that 'without the removal of the conditions complained of no mere relaxation of the pecuniary terms of rent would suffice, inasmuch as 'where the department interferes in the working details it is impossible to do business satisfactorily. It cannot be denied that these offers are ample 'compatible with due protection of the interests of the revenue;' and, more important still, the acceptance of one or other is in effect necessary for a much greater interest—the interest of the public at large. The telephone is a useful adjunct in our daily business, and it is as absurd to suppose that it will prosper under the fostering care of telegraph clerks as to imagine that our great railway system would have grown to its present dimensions under the charge of mail coachmen or hotel ostlers."



THE ZIPERNOWSKY-DERI DYNAMO OF GANZ & CO., BUDA-PESTH.

—— The demand for electric lights in the city of Hartford, Conn.,—the home of those two splendid companies, the Schuyler and the Mather—is steadily increasing. There are now 100 lights furnished the city by the Hartford Electric Light Company, exclusive of the five lights on the Capitol grounds. That they have answered all the purposes claimed for them is beyond dispute. To return to old customs, and get along without these brilliant illuminators, would be a change the public would not approve of. The Street Commissioners have before them a large number of petitions for the establishment of electric lights on Asylum and Farmington avenues as far west as Woodland street. Among the petitioners are the Rev. Francis Goodwin, Jacob L. Green, S. L. Clemens, Charles E. Perkins, Charles D. Warner and Charles E. Gross. There are also petitions awaiting action in the Street Board for electric lights on Park and Washington streets. The requests for these lights, in each case, are well founded, and the petitioners are in hopes that favorable action will be taken before winter sets in.

The Zipernowsky-Deri System.

A type of the dynamo, owned by Ganz & Co., of Buda-Pesth, is shown on this page. This is a machine with 18 magnet poles, and, it is stated, yields from 50,000 to 60,000 watts. In these machines the magnets rotate, whilst the coils in which the principal current is induced, are fixed, and that current is led off from fixed terminals. The commutator serves to reverse a small portion of the induced current in one direction, and then to use it to excite the magnets. In the latter circuit the second spiral of the compensator is introduced in such a manner that its E. M. F. increases the tension at the brushes of the commutator in the same proportion as the strength of the principal current grows, that is, as the number of lamps in action, etc., increases in the secondary circuits.

The inventors also apply this method of regulation, according to circumstances, to generators with alternate currents, which are separately excited; the exciting current is frequently generated by transformers. A letter, to the REVIEW, from Messrs. Ganz & Co. is published in this issue, and to it we invite the attention of our readers.

*** The *Lowell Times* seems to be very much disturbed about a paragraph printed in the REVIEW last week, which said "The Erie Company was likely to get all the law they wanted before they got through with the former managers." The *Times* wades through a half-column of space trying to prove the Erie Company is being managed in a way far superior to that of any Company in the world. This, of course, is nonsense, and if the *Times* had the courage to state plainly what it only dares hint at regarding the former managers, it, too, might have a chance to enjoy a lawsuit.

The best answer to the article in question, however, is the last report of the Erie Company under the old management, which we print herewith. As this report is made by the same treasurer, it is of course as reliable as the one just made. Why do not the Company give the number of subscribers added and lost? Are they making a net loss? Does the construction money now spent show a gain in earnings? It surely did a year ago. Why the Company should not have wiped their debt out entirely we cannot see, as, according to their own figures, they have earned over $200,000 over all expenses including construction. The stockholders have contributed this amount to the stock. Some of the stockholders still claim that more management and less law is needed.

We have always said, and still believe, that the Erie Company has a valuable territory which, properly handled and harmony restored at home, would make the stock sell for a much higher price. The following is the last statement under the old management:

LOWELL, MASS., July 26, 1884.

To the President and Directors of the Erie Telegraph and Telephone Company:—Complete returns from the various divisions show the earnings, expenses and disbursements for the three months ending June 30, 1884, as follows:

Earnings.	
Agency	$2,298.00
Exchange	121,420.87
Ex-territorial	6,341 59
Messenger	28 58
Telegraph commission	90.05
Toll lines	5,510.89
Miscellaneous	3,809.19
Expenses.	
Operating	$29,107.02
Repairs and maintenance	7,822 69
Rent	1,557.05
Postage, printing and stationery	642 39
Insurance and Taxes	2,132.81
Instrument rental exchange	27,511.14
" " agency	1,638.87
Interest	1,420.51
General expense account	980.46
Total expenses	$72,812.94
Total earnings	$139,499.17
Total expenses	72,812.94
Net earnings	$66,686.23

which is at the rate of 5 55-100 per cent. on the issued capital, $4,800,000.

We have expended in construction during the three months $26,506.68, and have earned above all expenses and construction $40,179.55, which is at the rate of 3 34-100 per cent. on the issued capital.

We have made a net gain of 325 subscribers, and have a total of 9,267 connected July 1, 1884.

CHARLES J. GLIDDEN, Treasurer.

Electrical Review.

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GEO. WORTHINGTON, - - - Editor.
CHARLES W. PRICE, - Associate "
LOREN N. DOWNS, - - - President.
C. C. HASKINS, GEO. A. HAMILTON, JOHN W. BEANE, } Consulting Electricians.

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EDITORIAL ANNOUNCEMENT.

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We invite correspondence from Electricians, Inventors and the Telegraph and Telephone fraternity and those engaged in Electric Lighting on matters pertaining to electrical and scientific subjects, and all facts of special interest in connection therewith.

We extend to manufacturers of electrical apparatus an invitation to send to this office any and all facts concerning their business which will be of interest to the public. We make no charge for publishing news.

Subscribers can at any time have the mailing address of their paper changed by sending both old and new address.

Mr. J. Viennot, 150 South Fourth Street, Philadelphia, is our accredited representative for Pennsylvania.

Mr. C. C. Haskins, 118 LaSalle Street, Chicago, Ill, will represent the REVIEW in the West.

Messrs. Wm. Dawson & Sons, 121 Cannon Street. London, England, are our representatives for Great Britain.

NEW YORK, NOVEMBER 14, 1885.

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The Bridgeport Electric Light Company has been awarded the contract for lighting the city of Bridgeport, Conn., for two years. This company is one of the best managed in the electric-lighting field, and the city fathers of Bridgeport have shown commendable judgment in making this award.

The Nebraska Telephone Company has come to the front again, paying the tenth quarterly cash dividend of two per cent., on the 31st, and carrying forward a surplus. In the construction department considerable work is being done by this company. They have just completed a line from Tremont to Columbus, a distance of 49 miles, 30 poles to the mile, No. 12 hard-drawn copper wire, B. & S gauge. The line works like a charm. Columbus is 91 miles by wire from Omaha, with five intermediate stations. This company has commenced to put up another wire on old poles from Tremont to Arlington, a distance of 9 miles, and will build a new line from Louisville to Weeping Water, a distance of 10 miles. This will make 88 miles of extra-territorial line built this summer, principally from earnings, besides all needful exchange construction. This is a splendid record.

There is a general activity this fall in the electric lighting field that speaks well for this rapidly extending business. The news columns of the REVIEW show, each week, the work and its rapid progress.

We hear from several committees that preparation is being made for the next meeting of the National Electric Light Association. No time should be wasted, as there are but four months more until the meeting in Baltimore.

Evidence has been introduced in the hearing at Washington, which proves the telephone to have been conceived in 1849. We may yet hear that Noah was the original inventor, and was prevented from starting an exchange on the ark through lack of a place to drive a ground rod.

Cornell University has been notified by Mr. Edison that he will present it with a complete electric-lighting plant for the new workshops and the mechanical laboratory. This is a generous gift, made personally by Mr. Edison, and will be a valuable acquisition to this great institution.

Those of our readers who invested in the various and numerous wildcat telephone schemes, will be interested in a communication relating to the Pan Electric Company, published in our telephone news. This correspondent has given a very correct account of these peculiar telephone methods, but which now are things of the past.

The REVIEW is not given to self-laudation, but feels called upon to express its gratification over the endorsement it has received to so large an extent for its recent utterances on the progress of incandescent lighting. From the several letters of commendation received, we publish one in another column. To this writer and others we have only to say that this journal will ever be found espousing the side it deems right, giving even and exact justice to all interests. We believe this is the only basis on which a successful journal can be founded and conducted.

In Philadelphia an ordinance has been recommended for passage which grants permission to the American Telegraph and Telephone Company to lay underground pneumatic tubes, conduits and cables under the streets of the city. Mr. Sargeant, general manager of the Brooklyn Telephone Company, stated that the A. T. and T. Company had built a line, starting from New York, and through New Jersey to Camden, and are now waiting for an entrance to the city. If permission is granted, it is intended to stretch a cable across the river and lay their wires underground on Walnut street to Fourth, and thence to the offices of the Bell Telephone Company. When the work is completed all persons in Philadelphia will be able to communicate by telephone with parties in New York.

A new catalogue of the "American System of Electric Arc Lighting" has just been issued by Edward H. Goff, president and general manager. The publication is an admirable one; finely illustrated with engravings of the Fuller-Wood system, and contains much information written in an entertaining and convincing style. Mr. Goff pays his respects to the work of the press in advancing the interests of the electric light, in the following words: 'One of the agencies used by the electric-light people in making their system of illumination popular, was what is commonly called 'printer's ink.' This is the age of the newspaper, the technical journal, the magazine, the text-book, the age of typography, photography, lithography, and engraving; when graphic effects present to the mind correctly and comprehensively the salient points for a proper understanding of what is described and illustrated. The press throughout the world has been most prompt and generous in its recognition of the superiority of the electric light, and has aided the public understanding to grasp its significance, its benefits and its possibilities." The catalogue concludes with some good advice on the back cover, which the REVIEW heartily endorses.

Mr. Thos. W. Lane, former superintendent of the Western Electric Company, at Boston, has succeeded Mr. Geo. M. Phelps, who has resigned as superintendent of the Western Electric Company, in New York. The Western Electric Company loses a good man in the departure of Mr. Phelps. In Mr. Lane, a more worthy successor, or a better practical man for the responsible duties of the position, could not have been secured. He was during the war superintendent of the Spencer Rifle Company, in Boston, where they employed over 1,500 men, and his extensive experience in this respect has particularly fitted him for handling the large business of the Western Electric Company. Mr. Harry Thayer, the very capable manager, will find a strong co-worker in Mr. Lane.

The hearing before Secretary Lamar to have the Government institute judicial proceedings to annul the Bell telephone patents will probably continue all week. A large number of attorneys are present, Mr. J. J. Storrow representing the Bell Company. Affidavits were read in support of the petitioners. Zenas Wilbur, an examiner in the electrical division at the time the Bell patent was passed, affirms that, after examination of Gray's caveat and Bell's application, he suspended Bell's application and notified Gray to complete his caveat within three months. Those orders had been revoked and patent issued to Bell. In all his experience in eleven years' practice, affiant had not known of a similar ruling. Had the usual course been followed after the suspensory order, Bell could not have received a patent, and had Meucci's caveat been renewed in 1875 no patent could have been issued to Bell. Affiant did not suspect crookedness at the time. He did not believe that Bell's application was for a talking telephone, but for multiplex telegraphy, and is convinced that his device as described in his original application is inoperative. Mr. Beckwith, representing the Globe Company, read an affidavit of Antonio Meucci describing his inventions, and exhibits were laid before the Secretary to support his allegations. Meucci recounts his struggles against extreme poverty, which he says prevented him from taking out a patent for a telephone conceived by him in 1849 while in Havana, and for which he had made a caveat in 1871. A long transcription from his notes of experiments in telephony antedating the Bell patents was read, and a number of corroborative affidavits were submitted.

THE RECENT TESTS OF DYNAMOS AT PHILADELPHIA.

The journal of the Franklin Institute, for November, contains the full report of the Committee on Competitive Tests of Dynamo-Electric Machines conducted under the auspices of the Institute, and for the care and ability displayed it is certainly deserving of the highest praise. The committee consisted of the following named gentlemen: Louis Duncan, Ph.D., Ensign U. S. Navy, chairman; William D. Marks, Professor of Engineering in the University of Pennsylvania; George L Anderson, Lieut. U. S. Army; J. B. Murdock, Lieut. U. S. Navy, and A. B. Wyckoff, Lieut. U. S. Navy.

The machines of but two systems were entered; those of the Edison and United States Electric Light Companies, the former entering four and the latter three. It was, indeed, a battle of the giants, but the Weston machines, in the end, proved too much for their opponents. The Edison dynamos acted badly from the start, and in two out of the four the armature insulations gave way before the tests were over, as will be seen from the table of efficiencies given in another portion of this issue. The 400-ampere machine, No. 20 was an especial offender, as will be seen from the following quotation from the report of the committee: "The full-load tests are marked unofficial because the preliminary run of ten hours was not on full-load. The machine was started at the usual time, midnight, with about the right load, *but in a few hours the power fell to about fifty horse-power*, and remained about the same till noon of June 19th, when *by increasing the number of revolutions* the proper load was nearly attained. The tests were to have been repeated the next day, but unfortunately the *insulation of the armature gave way*, making this impossible. The tests seem to agree quite well. It is hard to compare the first full-load measurement with the others, as the conditions were different. The two full-load measurements, made under about the same conditions, agree almost exactly." In the above the italics are our own, and we emphasize these points in order to show the fallacy in the high total efficiency on full load, 96 51 per cent., obtained for this machine by including the result of the first test at full load made at 9.45 A. M. of the 19th, and so far under the required conditions that the committee were compelled to declare it "unofficial," evidently intending that it should be taken for what it was worth and no more. The speed was increased, the proper load of 400 amperes nearly attained, and the two concluding measurements made when the armature insulation gave out. If the tests of this machine are to be used at all, we fully agree with the committee in their implied recommendation to base our estimate of its efficiency, at full load, on the last two tests made under nearly the same conditions, the one at 1.30 P. M. and the other at 2.45 P. M. of the 19th. Thus we obtain an average total efficiency for this machine of 96.52 per cent., and an average for all four of the Edison machines of 95.40 per cent., but if we throw No. 20 out entirely the average efficiency then becomes 95.05 per cent.

The average of the Weston machines on full load for total efficiency reached the high figure of 95.81 per cent., the advantage of the latter over their competitors at one-quarter, one-half, and three-fourths load was even more marked. However, when we come to consider the point of commercial efficiencies we find the Edison machines leading their rivals by a small amount, yet it is a question which experience can only answer, whether the extra resistance in bearings, etc., which Mr. Weston has introduced to secure strength, ventilation, etc., and, which conduce mainly to this result, may not in the long run offset this apparent disadvantage. After all we are computing in tenths of per cents., a fact which brings with it a very forcible reminder of the extraordinary perfection to which both of these machines have attained. They are, indeed, monuments to the master minds that conceived and nurtured them through many stages of improvement to their present high state of efficiency.

ARE THE WIRES UNDERGROUND?

The time is come when, under the law, the wires should be under ground.

We dig down deeply into the earth and adjust our spectacles, but the only things resembling wires turn out to be worms; a happy thought strikes us, and, ceasing our labors, we look overhead, and, sure enough, there they are still!

And how is this come about? Have not the Legislature and Mr. Daly, or rather Mr. Daly and the Legislature, decreed that the wires should be under ground by the first of November?

Natural laws and economy forbid!

And, pray, what care Mr. Daly and the Legislature for natural laws or economy. There's no such thing in Nature as Legislatures and Dalys, and there's no such thing in the Legislature as economy!

Nature, we are told, abhors a vacuum, and, if we are to judge from the contempt with which she treats legislative enactments, she also abhors a legislature.

Daly urged the Legislature to register a vow against induction and retardation, and the statute on the books attests its obedience.

But there they are still, nor can the finest instrument show any diminution.

Canute rebuked his courtiers for their presumption, and it is now in order for the Legislature to rebuke its Daly.

But Daly thinks it's only the ignorance of the electricians that prevents the sinking of the wires, and the electricians think it's only the ignorance of a Daly that could suggest such a scheme.

Daly thinks the electricians make a great

deal of noise. It's fortunate that they do, for otherwise we might have to listen to Daly.

Shakespeare evidently had Daly in mind when he wrote the scene between Patroclus and Thersites "Troilus and Cressida II., 3" (slightly revised).

Patroclus Daly—"Who's there? Thersites? Good Thersites, come in and rail!"

Thersites—(an electrician)—"If I could have remembered a gilt counterfeit, thou wouldst not have slipped out of my contemplation. But it is no matter. Thyself upon thyself! The common curse of mankind, folly and ignorance, be thine in great revenue! Heaven bless thee from a tutor, and discipline come not near thee! Let thy ignorance be thy direction till the end! And if they that lay thee out say thou art a fair corse, I'll be sworn and sworn upon't they never did for any but monstrosities. Amen. Where's Achilles?"

The selection of the subway commission seems not to have been so bad. They are not electricians, but they seem to be reasonable beings.

In this respect they differ from Mr. Daly, and those members of the Legislature who voted for his little bill.

If left to them, they would probably have made the selection from the lunatic asylum

Their strongest argument was: If the gas-pipes and water-mains can go under ground, why can't the wires go under ground?

Following the same process of reasoning, we would ask: If the wires can go under ground, why can't the gas-pipes and water-mains be strung overhead along the poles?

So far, the gas-pipes and water-mains remain under ground, and the wires and poles, like the poor, are always with us.

Arachne still keeps possession of her web!

COMPOUND-WOUND DYNAMOS.

Just at present there appears to be considerable agitation among our English confreres. A bombshell has been thrown into camp by the Anglo-American Brush Company in the shape of a warning to English manufacturers against infringement of their patent for compound-winding in dynamos (No. 2,003, 1878), and judging from the noise it has occasioned, in defence, it would be reasonable to suppose that Chinese tom-tom tactics had been adopted.

It seems that last February the Brush Company applied to the British Patent Office for permission to file a disclaimer, which, after due examination by the authorities, was granted, notwithstanding the opposition of the Siemens Brothers and Mr. Crompton, both manufacturers of compound-wound machines. The company has issued due notice that all infringement will be promptly prosecuted, and hence the trouble.

For the past few months the claims of the many rival claimants have been thoroughly aired through the scientific press in England until there is not room to hang a doubt upon; the matter is very simple, and yet the most absurd claims continue to be urged. The latest phase of this war of words is the attempted renovation of an old patent of Mr. S. A. Varley to fit the case; but compound winding is one thing and compound winding *for constant electromotive force* is another. A careful perusal of the specifications of Mr. Varley's patent prove conclusively that his idea was a simulation of the operation of the magneto-electric machine, obtaining thus its advantages without likewise assuming its faults. Whereas, in the Brush patent, the object expressed is an automatic regulation of the electromotive force *per se*, with reference to varying external resistances. If these specifications do not indicate the maintenance of constant electromotive force, no matter what the external resistance, we are at loss to know what phrasing in the English language would express it.

Mr. Varley's patent (No. 4,905), granted in 1876—if the entire context be considered, and not an extract here and there to suit a particular cause—will be found entirely foreign to the subject of constant-electromotive-force machines as now constructed, both in avowed object and evident intent. This is the whole case in a nutshell, and we must aver that there has been an overabundance of the "*me too*" principle displayed in the controversy. However, we have so often, heretofore, been treated to a resurrection of the rag-babies of unsuccessful invention and vain attempts to blow animation into their almost forgotten frames, following upon the heels of practical success, that, perhaps, we should learn to expect the exhibition.

GENERAL WESTERN NEWS.

The signal service corps of the English army, under the direction of Major Thrupp, inspector-general of that service has recently made some interesting experiments continued through an entire week, with optical telegraphy.

Stations not equidistant were communicated with by means of flash-lights, flags and heliographs. Each station was provided with all the necessary apparatus, and short sentences, about thirty words each, were transmitted, selected with especial reference to military use. The distances of the stations were 22.5, 19, 17.5, and 14.5 kilometers. Both oxy-hydrogen and oil lamps were used. The gases for the former were made upon the ground, but among the apparatus, which is quite complete, are iron receptacles for the transportation of compressed gases, for use where the manufacture would be inconvenient or impossible.

The hours of practice each day were from 9 A.M. till 12.30 P.M., 3 to 6, and 8.30 to 11 at night. One station above Epsom, near London, lost many of the day signals because of the cloudy atmosphere of London, but the night signals were in general thoroughly satisfactory.

As was stated some weeks since, the superintendent of construction of the Chicago Telephone Company, Mr. J. W. Brennan, resigned his position, to take effect on the 31st of October. William was a very general favorite with the employes of his department, and the boys learned with sincere regret of his intended change of base.

Saturday night, at the close of his official career an apparently impromptu gathering at his late headquarters turned out a surprise party, the surprise consisting of the presentation, by the employes, through Mr. N. Rousseau, his assistant, of an elegant gold watch, chain, and charm. Mr. Rousseau's remarks were well chosen, though brief, and gave the retiring officer the strongest assurances of the kindly feeling and respect of the entire department and the sincere regret they felt at parting with their old leader and friend, while wishing him every success in his new or any future callings.

Mr. Brennan was completely taken aback by the turn affairs had taken, and required some time to collect his ideas. At the last however, he recovered, acknowledged both the surprise and the handsome present, and supplemented his remarks with an invitation to the crowd to go and see a friend of his—a proposition eminently satisfactory to and readily acquiesced in by all present.

Our new City Hall plant is nearly ready for work, and it is expected to have the lights turned on by the 9th at the farthest. Everything looks favorable for a successful exhibit and an excellent plant. When the boys in the building can turn off the gas and turn on the electric light, there promises to be much rejoicing.

On Saturday evening, the 1st instant, the good people of Peoria, Ill., had an experience with a runaway current of electricity which was rather expensive. A new electric-light plant was established and tested up in the usual manner, presumably with a magneto ringer—and the lights blazed up according to the programme. About the same time the Chief of the Fire Department, who was in the Water Works office, heard a series of mysterious noises in the fire-alarm office in an adjoining room. Opening the door he was confronted by the perfume of burning rubber, brass, paraffin, etc., and discovered the dickens to pay generally. Peoria has five fire-alarm circuits leading into this office, running to galvanometer, repeater and switch-board. These various portions of the apparatus were more or less injured, the galvanometers and lightning arresters completely ruined. The table was set on fire. The current had entered the office by a cross from the light wire on which there was a ground, and completed an arc at the lightning arrester. When a current like that gets into a telephone or telegraph office it is much like measles in a district school—you can't tell where it will stop. Fortunately the party in charge of the dynamo discovered that the line was grounded, and shut down about the same time Chief Smith disconnected at the office. The damage sustained by the city will be from $300 to $400.

Our exposition building is again undergoing transformation this time for the annual fat stock show, which opens on the 10th instant. There was some struggling for the contract to light the building on the occasion, which was finally decided in favor of the Van Depoele people, who will put in dynamos and fifty arc lights. The Corliss engine, which had lately gone into winter quarters, and was fully in a condition of hibernation, will have to rouse from its lethargy, and do the work for the annual show.

Another impediment to the running of wires under sidewalks, which have been decided to be a part of the streets, and thus under control of the public works department, has been discovered. To bring the question to a head, "whether the running of electric-light wires beneath the side walks would increase insurance rates," the conduit company has referred the matter to the insurance underwriters. The question has been placed in the hands of a committee, of which T. S. Cunningham is chairman. The question is one upon which there is such diversity of opinion as to possible dangers, that a warm discussion is anticipated. It is highly probable that the whole disturbance arises from a disposition on the part of property owners and occupants, to keep off a class of persons they are inclined to regard as trespassers, and possibly through this action to demand damages or rental or something or other to help fill up the debtor page of the cash account.

The month opens with a $20,000 fire. At 12.45 A.M. on the 1st, a blaze was discovered in a four-story building at 16 and 18 Canal street. The usual trouble with over-head wires was experienced by the firemen in raising ladders to fight the flames in the upper two stories. Two of the ladders became entangled in the net work, and took fire before they could be removed.

Charles Hoffman, of Chicago, has gone to Racine, Wis., where he has been appointed superintendant of their electric-light plant.

A Minneapolis writer has interviewed Col. W. S. King, of that place, relative to the rumored connection of Ed. Stokes with the North American Telegraph lines. Col. King denies the correctness of the rumor. "The whole truth," he says, "is that C. M. Loring, R. B. Langdon, and a number of other Minneapolis and St. Paul gentlemen with whom I am associated, have incorporated as the North American Telegraph Company, and we are going to establish a telegraph line between Duluth, Minneapolis, St. Paul, Milwaukee and Chicago. We think we ought to have a cheaper system in the Northwest than we have, and we mean to give the people reasonably cheap competition service between these points, and that is all there is to it. As to a line to St. Louis, that has not yet been thought of.'

Galesburgh, Ill., is considerably pestered with applicants for electric-light privileges. No less than four companies have asked franchises of the authorities.

The Dorsett Underground Company at St. Louis is rapidly approaching tangibility. An ordinance was introduced into the House of Delegates on the 3d instant, in which the following incorporators are named: Geo. D. Capen, Erastus Wells, David B. Gould, Ellis Wainwright, George Mills, D. H. Dorsett. The term of the charter is fixed at 50 years. The city is guaranteed the free use of the conduits for its fire and police wires, and a bond in the penal sum of $50,000 is required to be filed with the city register within 90 days, and the work is to be commenced within months after the approval of the ordinance. The statutes requiring that all corporation stock shall be fully paid up, $600,000 was deposited the following day to the credit of the company in the Commercial National Bank of St. Louis.

A special car from Milwaukee on the 2d inst. brought to Chicago a party of 37 gentlemen interested in electric lighting and kindred enterprises. After a comfortable supper at the Fremont House, under the guidance of the City Electric Light inspector, they took a stroll through the central portion of the city to compare the illuminating qualities of the various systems. One street crossing in Chicago is especially favorable for such observations. In sight from that standpoint are lights run by eight different systems, and at this place the crowd remained long enough to provoke many witty remarks from passers-by, who evidently mistook the procession for a delegation from some granger township. The party consisted of nearly all the City Council of Milwaukee, headed by the President, and supplemented by several other city officials.

Tuesday the gentlemen devoted to an examination of the Dorsett conduit, its manufacture and peculiarities of construction and installation, as guests of the patentee and inventor. They returned home on Tuesday evening, and expressed themselves highly pleased with their sight-seeing and the attention shown them.

On the afternoon of the 6th the judiciary committee of the Milwaukee council, who were among the visitors to Chicago on the Monday previous, met and prepared a substitute for the underground ordinance previously presented to the council, which contains much the same features as the St. Louis ordinance, and, indeed, seems largely patterned after it.

Several points which were unsatisfactory in the first ordinance drafted, have been expunged or changed, and the ordinance was finally agreed upon, and will be presented at the next meeting of the council, when there is no doubt of its adoption by that body, and endorsement by the Mayor in due course of time.

A few weeks since a sensational article was published in one of our daily papers, detailing very particularly the gyrations of a colored contortionist who got hold of a railing on which an electric-light wire was lying. Inquiry proves that there was about as much spark on that occasion as is often evolved by a rapidly moving driving belt. The matter would have received no notice but for the fact that the article was copied into the electrical papers, and what was only a sensational joke, looks away from home like a serious affair.

Col. S. G. Lynch, at 144 La Salle, furnishes the following quotations of telephone stock values:

Chicago	$375 @ $400
Central Union	50 @ 53
Michigan	64 @ 67
Iowa Union	18 @ 20
Great Southern	30 @ 32
Colorado	10 @ 12
R. M. Bell	40 @ 45
M. & K.	54 @ 57
United	13 @ 14
Cumberland	70 @ 75

CHICAGO, Nov. 10, 1885.

An English view of the recent telephone trouble is contained in the following, from *Invention and Inventors' Mart:* "We are by no means uncompromising supporters of the Bell Telephone Monopoly, which operates very injuriously on the telephone industry generally, but we consider it only fair that the Solicitor-General's gross blundering should have been rectified. It would have constituted a most dangerous precedent, which, especially in a country like the United States, where public functionaries have not at all times been above suspicion, might have seriously interfered with the satisfactory and impartial administration of the Patent Laws."

Telephonic News

⁂ Major Bagnold, of the royal Engineers, has assumed charge of the British military telephone system in Cairo.

⁂ Prof. Bell, of the telephone, says the time is coming when people will be able to see, as well as to hear, one another at long distances. Perhaps then some investors will be able to see a dividend.—*Lowell Courier.*

⁂ It is announced that the International Bell and Tropical American telephone stock belonging to Continental Telephone Company stockholders is ready for distribution at 95 Milk street, Boston, on the basis of 25 shares of Tropical and 3 shares of International for every 5 shares of Continental.

⁂ Arrangements are being made to erect a telephone line between Pottstown, Pa., and Knauertown. If built it will be a great convenience to the industrial interests of Knauertown, connecting with Falls of French Creek and other stone quarries, the forge, mills, etc., in the immediate vicinity.

⁂ It is reported that the International Bell Telephone Company, Limited, has the money for another 2½ per cent. dividend in January. This company operates in Europe. In its financial statement of June 18 the company expressed confidence in its ability to pay 5 per cent. on its capital of $1,387,000 in 1885, and the above report is in accord with this expectation.

⁂ A Washington stove dealer invented a house telephone, a simple little contrivance, making use of gas and water pipes instead of wires, attached to which in each room was a transmitter and receiver. But he was informed that his machine was an infringement of the Bell, though he used no electrical current, and he abandoned his intention of making a business of furnishing these instruments in houses.

⁂ The Kansas Telephone Company has filed its charter at Topeka, with a capital stock of $50,000. The principal place of business named in the charter is Manhattan, and the directors for the first year are: George W. Higinbotham, R. B. Shilman, Orville Hemtress, Wm. Knostman, Wm. Higinbotham, S. A. Russell, John H. Werner, Chas. W. Russell and N. Balard, all of Riley County. We wonder what telephone these gentlemen intend to use.

⁂ The directors of the New England Telephone and Telegraph Company held a meeting at Lowell, Wednesday, General Thomas Sherwin presiding. The financial report for the month of September was submitted as follows: Gross receipts, $77,366.84; gross expenses, $60,583.66; net earnings, $16,783.18; total earnings, $9,378.95. The committee appointed to discuss the matter of a dividend were granted further time, the taking out of a number of telephones evidently having some weight in causing the postponement. Throughout the territory controlled by the company it was reported that between 1,000 and 2,000 telephones had been taken out.

⁂ The Cincinnati telephone people are experimenting with the time system of the National Time Company, of Boston. The expense of putting in the time system in all the exchanges, thus effecting every telephone in the city, will be about $5,000. For this the telephone company will receive no financial return whatever, and the only reason for their considering the adoption of the system is that it may be of a great deal of benefit to the subscribers. Capt. Stone, general manager of the company, will be pleased to hear from all his subscribers in regard to the time system. If they agree that they will be sufficiently benefited by it, the company will have an incentive to go to the necessary expense. This consideration for its patrons, on the part of the telephone company, should be duly appreciated.

⁂ Mr. F. W. Jones, general manager of the United Telephone Company of the River Plate, Limited (which controls, under the Bell patents, the territory of the Argentine Republic and the Republics of Uraguay and Paraguay, and some other territory in South America), has been in New York for a few weeks past, and sailed on Thursday for London, where the general offices of his company are located. There are 1,000 Bell telephones in use at Montevideo, and at Buenos Ayres, where Mr. Jones makes his headquarters, there are about 1,500 subscribers to his company, and about as many more to the opposition.

⁂ The getting up of the Bell patents is said to have been the best piece of work of the kind in the history of patent cases. The claims and specifications were so drawn up that nearly everything touching the transmission and receipt of sound by electricity is thoroughly covered. Some of the claims were very broad, made so intentionally, because the question was not as well understood as now, and it was necessary to make the statement very general so as to make it intelligible. But at the same time every little point was treated in detail, so that besides the general patent there is a sort of chain armor of specific patents that render it impossible for any other company to get in upon them.

⁂ A communication has been addressed to Select and Common Councils of Harrisburgh, Pa., by the Board of Directors of the Pennsylvania Telephone Company protesting against the additional $50 per annum imposed on the company for tax. Among the reasons set forth in the communication are: The present tax of $200 is a heavy one, in view of the fact that the capital stock of this company is only $750,000; while that of the Western Union Telegraph Company is $80,000,000, and it has only been taxed the same amount as this company; whilst the other telegraph companies are taxed but $100 each, and the electric-light companies but $50 each. The court in this county has recently decided that this company is a telegraph company, and taxable as such; and hence, under the constitution and laws requiring equality of taxation, can only be properly placed on an equality with other telegraph companies of equal capital. There has been no increase of the business of this company in this city since the $200 tax was imposed, and hence the proposed increase would be unequal and unjust. The only shadow of excuse for the proposed action of Councils, is that the Telephone Company use the city fire-alarm poles. The company further contends that by erecting new and substantial fire alarm poles without one cent of expense to the city, saved it a very large outlay. In conclusion the communication says: "Such capricious and unequal taxation, if imposed, could only result in compelling this company in self-defence to increase its charges to other subscribers in the city, to make up the loss thus occasioned."

⁂ At Ottawa, Ill., the transfer of the telephone central office from old to new quarters has been satisfactorily accomplished. Ottawa now boasts of a very complete exchange. The wires are led from the poles to the operating room through two 100-wire Patterson aerial cables. The cables terminate on the large 60-foot pole in front of the office. This pole is double cross-armed to receive the wires from both ways and equipped for 280 lines. The manner in which the lines are carried from the outside wires to the cable box is new and is the invention of Charles H. Wilson, assistant general superintendent of the company: A groove is cut on the face side of each arm where the wires are carried under a galvanized iron cover (removable at will) to the center of pole, where they enter a trough from the back side which extends from the top of pole to the lower cross-arms, which is also covered with a removable iron cover. The wires through this trough enter the cable box situated on the lower cross-arms where the cables terminate. The wire used on the pole is No. 18 office wire. There are between 4,000 and 4,500 feet strung on the pole. In the office is a cross box for the protection of the board against electric-light and other strong electric currents, the working of which is a pronounced success. Each subscriber's line passes over a bronzed plug which is insulated from the line by a thin film of mica. The opposite end of the plug rests against a stiff spring, which is connected with the ground. The linewire holding the plug in position is a very fine copper wire which will fuse easily, releases the plug which is thrown by the spring out upon the office floor, leaving the wire grounded and notifying the operator that the line is open. The cross box is set adjoining and parallel with the key-board. Mr. E. S. Enyart is the manager of the Ottawa exchange. A healthy growth is expected during the year.

⁂ The long-anticipated trouble between the Board of Public Improvements of St. Louis and the telegraph and telephone companies, relative to the attempt of the board to regulate the location of telegraph poles and wires, has at last culminated in a legal proceeding commenced by the Bell Telephone Company, which has applied to the Circuit Court for a writ of mandamus against the board. It appears that the board, under an ordinance to regulate the erection of telegraph and telephone poles, adopted a series of rules on the subject, and refused to grant permits to companies which would not sign a condition to comply with these rules. The companies were called upon to erect poles of such dimensions as to admit of at least fifteen cross-arms of the usual size; that other companies should be allowed to use one or more of such cross-arms, at an annual rental to be paid to the company owning the poles of 40 cents for a half cross-arm and 60 cents for a full cross-arm, except in cases where the party asking for room on another company's poles was itself charging that company a higher rent per cross-arm on its own poles previously erected, in which case an equal rental might be demanded, and that all poles must be erected within thirty days after permits had been obtained. The Bell Telephone Company refused to obligate itself to comply with these rules, and the board refused to issue permits. Considerable correspondence took place between the company and the board, but no terms were agreed upon. In its application for a mandamus, the company states that it was incorporated under the laws of the State, and is authorized to construct, own, operate and maintain telephone lines in the city of St. Louis; that under the State law the mode of construction—where the posts, piers, etc., may be located—shall be regulated by the Common Council, but that neither the statutes of the State nor the ordinance regulating the location of poles have conferred upon the board the power to enforce the rules previously referred to, and in refusing permits to the company the members of the board have violated their official duty, and prevented the company from extending its lines and furnishing telephone facilities to the citizens of St. Louis. The application was referred to Judge Dillon, who granted an alternative writ of mandamus.

⁂ At Utica the Central New York Telephone and Telegraph Company has recently commenced to use a toll-line switchboard made by the Utica Fire-Alarm Telegraph Company. It is in the form of a desk made of cherry highly polished, and ornamented with a neat brass railing on which are hooks for memoranda. The annunciators are in an upright frame at the left of the switchboard, while the ends of the toll-line wires, 20 in number, are arranged in semi-circular form on the desk in front of the operator. On the upper part of the desk are similar "jacks" connecting with the bars with which all the telephones in use in Utica are also connected. When any of the subscribers on the toll lines call up Utica or any of the other toll lines, the operator can make the connection without leaving the desk at which he sits. The apparatus is a beautiful piece of workmanship, and Manager Nicholson pronounced it the most practical he has ever used. The business of the Company has steadily increased, principally for the reason that it is constantly extending its lines over new territory, and adding to the number of people who desire to communicate with Utica, the natural business center of central and northern New York. During the season of 1885, up to Oct. 1, it has erected 10,941 new poles on which 418.5 miles of wire were strung, while on the poles erected before this season, 59¼ miles of additional wire were placed. The total number of poles now in use by the Company in carrying toll lines in their territory is 40,145, while the total number of miles of wire strung on the same is 1,791¾. The Company has 39 miles of line under construction between Carthage and Lowville, and Watertown and Sackets Harbor. The total number of toll stations Oct. 1 was 352, and several more will be added this season. September was a pretty busy month on the toll lines centering in Utica. The total number of communications had was 25,020. The average cost to the public was 16 cents for five minutes' conversation, which includes both message and reply, making the average cost of each message and reply 8 cents. With the new toll-line switchboard in the central office, the Company is enabled to transact business with outlying towns more satisfactorily than ever before.

The Pan Electric Telephone Speculation and What it was Based Upon.

The Washington correspondent of the St. Louis *Globe-Democrat* sends his paper the following concerning telephone matters. The career of the Pan Electric is about ended:

"Here's something I took across the poker table at the hotel the other night in settlement of a little game," said a man well known in Washington. He held up a handsomely-printed certificate setting forth the following:

OFFICE OF THE PAN ELECTRIC COMPANY.

This certificate entitles —— to four and one-half shares of the capital stock of the Pan Electric Telephone Company, of the par value of $100 each, so soon as the validity of the patents is judicially determined in any litigation instituted for that purpose. But this certificate is not transferable except with the consent of the president and Secretary of the company endorsed hereon.

In witness whereof the company has caused its corporate seal and the official signatures of its president and secretary to be hereto attached at its office in the city of Washington, D. C., on this the 1st day of May, 1885. J. E. JOHNSTON, President.
CASEY YOUNG, Secretary.

"What is it worth?" was asked.

"Well," was the reply, "it represents a poker debt of $60. Just now there don't seem to be any way of realizing on an interest in the Pan Electric. But it was worth a good deal a year or so ago, and may be valuable some time again. You'll observe that it isn't stock, but a paper entitling the holder to receive so much stock under certain contingencies. The officers refused to have anything to do with the concern if stock was to be issued. Casey Young, the Memphis Congressman, who you see is down as secretary, said he didn't want to go to the Penitentiary. So this form of certificate was made use of. But there has been money made out of the Pan Electric—thousands of dollars."

"Who got it?"

"Oh, United States Senators and Representatives, and some other fellows who were let in on the ground floor. All the money they ever paid for their interests was just enough to print the stock and pay office expenses for a little while. Then Pan-Electric ran itself, and for a few months there was no lack of income."

"The method was this," continued the narrator: "A big show was made of the organization, and the names of prominent men as directors were freely used to give dignity and character to the scheme. The patents of Rogers were described and illustrated in pamphlets and extolled as superior to any thing yet discovered. With this basis the managers reached out and took in men of some influence in various Western and Southern cities. They would commission one or more to a city to organize a local company to handle the Pan Electric patents for that place. Here in Washington was the parent company. For so much stock and so much cash the franchise for a given locality

was transferred to the local organization. The man who acted as go-between and organized the branch company by enlisting local capitalists with whom he had influence received an agreed amount of stock and cash for his labor. In this way a Pan Electric company was organized in St. Louis and other branches in New Orleans, Birmingham, in several Texas towns, in Washington and elsewhere. As long as the organization of these companies went on, money flowed in here. Some of it was used to pay Rogers for his patents, but the most of it was divided, and some of these members of Congress have put into their pockets $4,000 for an investment of $300 or $400."

"It looks very much like a grand confidence game, to use plain words ?"

"Well, that is a rather harsh way of putting it. Better call it a shrewd speculation. Legal forms have been observed throughout, and I've no doubt some of those who went into the Pan Electric really did so in good faith, believing that the patents were valuable, and that the branches organized in the various cities would go into practical operation. Some of the organizers, no doubt, still take that view, and I am holding on to my certificate, as you see, carrying it in my pocket-book, for the possibility that some time the patents may be worth something. Just now the outlook for Pan Electric is rather cloudy, I must admit. I've no doubt some of the people in distant cities who paid good honest money for their stock in branch Pan Electric companies, feel very sore, and think they have been outrageously swindled. But, really, you know, Bell telephone companies were organized in about the same way the parent organization, selling franchises for so much cash and so much stock in branch companies. In that case, however, there was something to deliver ; the stock is very valuable, and Bell, the inventor, is a millionaire. In Pan Electric there may be something in the future to deliver ; stock is now rather a damage to the possessor, and poor Rogers goes around looking like a worse than bankrupt office-seeker."

"Has this Pan Electric company ever done anything with the patents beyond printing descriptive pamphlets and selling franchises to branch companies ?"

"Well, yes ; the organizers have gone through the forms of getting into practical operation. They had one of the former Bell telephone men, Ogden of Cedar Rapids, come on here and consider a proposition to start things. He looked the ground over and went to see the parties who control the patent on the switchboard. They wouldn't let him have switchboards for less than $25,000 apiece. The inventor of this portion of telephone apparatus is a Pennsylvanian priest, and his patent is a sweeping one. So far there has been nothing invented to fill its place, and the rights sell at this enormous figure. Ogden, after a thorough investigation, declined to take hold of the Pan Electric. The Bell telephone people, he said, were ready with lawyers and bondsmen and plenty of money to enjoin and hamper the Pan Electric people wherever the latter started their telephones, and would fight them by every means possible. The Pan Electric had been organized on a basis of prospective profits, and had no means to go into such an exhausting contest. Ogden dropped out after frankly saying that the only course for the Pan Electric people to pursue was to organize the branch companies and thus get in what money and influence they could, postponing practical operations until some of these legal difficulties were out of the way. That is just what has been done. It is rather rough on the capitalists of other cities who were worked by men in whom they had confidence, to put up money and form the branch companies, but this sort of speculation is going on all the time, and the Pan Electric is not the only scheme that has been floated by a few big names."

.... A new telegraph system will soon be announced from Washington, in which it is announced there is something that will surprise the electricians.

.... Edward S. Stokes, of New York, has held consultations with local capitalists in Detroit. It is proposed to construct a telegraph system in Michigan more extensive than that operated by the Western Union.

The Roberts Permanganate Battery.

Previous to the invention of the well-known Leclanche, the world was practically without a commercial form of open-circuit battery. All the known forms of battery that were in use would use themselves up on an open circuit to such an extent that their frequent refilling was necessary. When a satisfactory form of open-circuit battery was given to the world, new uses and new applications presented themselves, and electricity at once found itself displacing many old mechanical contrivances which never could have been successfully replaced if the old style of cells were the only sources of electric energy to be had. Thus, the open-circuit battery found a place for itself at once, and the world would now find itself at a loss if it were asked to get along without this most useful invention.

The Roberts Permanganate Battery, here illustrated, is neatly gotten up, and, so far as externals go, it is the equal of any cell in the market. In this battery, low internal resistance can be obtained without deleterious chemical action. In this battery a radical departure has been made in the solution used to attack the zinc. Permanganate of potash is the base of the solution. The difficulties in the way of its use were enormous, and not until some thousands of experiments had been made was the present success reached. To the permanganate are added bichromate of potash and the salts of an alkali. These are dissolved in water.

One of the merits claimed for this cell that it is ready for work instantly as soon as the solution is made, and no vexatious delays occur between the setting up of the battery and the obtaining of its maximum of current.

NEW BATTERY OF THE BREVOORT MANUFACTURING COMPANY.

Careful measurements, Mr. Roberts states, place the electromotive force of this cell at 1.7 to 1.9, and it gives about 3 amperes over its own resistance. The internal resistance is from $\frac{1}{2}$ to $\frac{2}{3}$ of an ohm.

These features are of great importance when it is considered that the additional strength of the Roberts battery has often been found sufficient to enable one cell to replace two sal-ammoniac cells in such work as bell-ringing, gas-lighting, annunciator work, and the like.

A very useful feature of this battery is, that the solution does not evaporate, and does not form climbing salts, which is so disagreeable, and this fact will no doubt be appreciated by electricians generally. A curious feature of this battery is, that the zinc shows so little waste when compared with the energy obtained. This may be due to the fact that the zinc is not taken into solution, but is deposited as an oxide of zinc. It may also be due to the fact that some form of electrical energy is the product of the chemical changes in the materials of the solution. These are interesting questions, but as yet no satisfactory answer can be given to them. But there have been demonstrated to the satisfaction of the inventor, that permanganate of potash being a most powerful oxidizer, and bichromate of potash second to it, are not only the cause of the depolarization in the battery, but also heighten the electro-motive force by giving up their oxygen to the nascent hydrogen of sal-ammoniac or other electrolyte, thus producing the double function of an excitant and a depolarizer, and for this reason, space for space and pound for pound this battery should be of very high efficiency and great longevity. And it is also stated as a fact, that the solution may be worked till useless and then replaced by a fresh solution, and so on for two successive charges, while the zinc element will continue to do its work and will not need replacing. When the battery has been worked till exhausted, the deep-red color of the solution changes and is succeeded by a light yellow color. This also takes place when the battery has been short-circuited for a sufficient length of time by accident, through very low resistance. In this latter event, all that is necessary is to replace the solution by a fresh one, and before doing so, to hold the lower end of the carbon in a gas flame till the ammonia is driven off, when the carbon may be replaced and practically a new battery is the result. In heating the carbon care must be taken not to melt out the soft metal connection at the top of the carbon. This cell will polarize, as must all open-circuit batteries, if used for work beyond their capacities, and which they are not fitted to do.

Another important feature in this battery is the Roberts mode of making a non-corrosive connection, which we believe to be entirely novel. This consists in forming the carbon with a hole in one end and inserting a screw therein loosely, and leaving a considerable space around said screw, and pouring around it molten alloy which will expand in cooling, thus soldering itself to the screw and expanding closely into the hole of the carbon, and making a very perfect carbon and firm support, the end of the carbon containing the screw; and the plug thus formed is plunged into boiling paraffine and is saturated with it, and as there are no deleterious fumes in the battery the contact remains perfect.

.... When the new weather bureau cable is laid between Nantucket and Martha's Vineyard, as will be done in a few days, an arrangement will be made so that the marine news at Nantucket will be telegraphed to the mainland.

.... Mr. L. C. Orvis, manager of the Hartford office of the Mutual Union Telegraph Company, died at the home of his brother, in Manchester, Vt., Wednesday night. Mr. Orvis had charge of the Atlantic and Pacific Telegraph office until it was absorbed by the Western Union, and then took the Mutual Union office.

TELEGRAPHIC

.... The B. & O. Telegraph Company are laying their wires under ground at Harrisburg, Pa.

... In certain telegraphic circles there is talk of a pooling scheme that will result in an increase of rates.

.... Iron telegraph poles are supplanting wooden ones throughout Switzerland. In Germany they are also being introduced numerously.

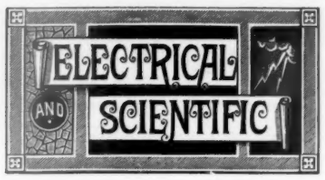
.... Arthur S. Parks, telegraph operator at the Russell Station, on the Boston and Albany Railroad, twenty-six years old, and a son of Horace Parks, of Russell, was struck by a freight train and received injuries from which he died.

.... In a recent interview Col. M. S. King, of Minneapolis, stated that "C. M. Loring and R. B. Langdon and other Minneapolis and St. Paul gentlemen and myself have incorporated as the North American Telegraph Company, and are going to establish a telegraph line between Duluth, Minneapolis, St. Paul, Milwaukee, and Chicago. Our object is to give a telegraph tariff that will be cheap for the sender, but not ruinous for the company. We are not organized to sell out."

.... The Washington, D.C., plant of the Postal Telegraph Company, including all its fixtures and all the wires underground and overhead within the District of Columbia, was sold at auction last week by United States Marshal McMichael to satisfy a deed of trust. The only bidder was Mr. Hillyer, acting for Mr. S. C. Elliott, the plaintiff in the suit, who bought the property for $4,000. The judgment was for $10,000. It is said the underground wires alone cost the Company $20,000.

.... Captain Wall, formerly of the Inman Line of Atlantic steamers, and now of the steamship "Dominion," has invented a system of marine telegraphing by night. By a combination of colored lights shown by three lamps about three feet apart in a horizontal position, and movable to any point on a revolving stand, so as to focus a vessel from any part of the compass, signs are expressed by representing eighteen letters used in the day book of signals, as well as "yes," "no," "answering," "code," "and," "annual," "signs." The operator can scarcely misunderstand the manner in which to express any given letter by this apparatus, for he had constantly before him, on an illuminated opal glass plate, a diagram of the various signals, while ten handles by which the apparatus is manipulated, are so arranged as to serve as a guide to the most illiterate seaman. In response to an invitation from Captain Wall, who was in Ottawa recently, his apparatus was inspected by Hon. Mr. McLelan, Minister of Marine ; Mr. Smith, Deputy Minister of Marine, and Capt. McIlbenny, of the same department, who, after a thorough investigation of its workings, expressed themselves thoroughly well pleased with it. The Spanish Government have already adopted the system for use in their fleet at Barcelona.

....The tournament of the telegraphers of Central New York was held on Sunday morning, at the United lines office in the Onondaga County Savings Bank Building, Syracuse, N. Y. The prizes were gold medals, offered as first, second and third prizes for the sending of 300 words under the Morse system rules. Spacing, punctuation and legibility were considered in figuring the percentage. The judges were A. E. Matthews and D. W. Bowers, of Syracuse, and G. J. Davidson, of Utica. C. H. Young, in 7 minutes and 43 seconds made a percentage of .462, and won the first prize; A. G. Kenyon, of Utica, won the second prize by a percentage of .460, in 7 minutes and 14 seconds; and J. L. Mallett, of Syracuse, the third in 7 minutes and 21 seconds, with a percentage of .457. The records of the remainder of the contestants were as follows: W. J. Stafford, of Syracuse, .415 in 7:09; J. F. Meaney, of Syracuse, .430 in 7:19; W. J. Cameron, of Fayetteville, .365 in 7:42; L. S. Hass, of Syracuse, .375 in 8:28; W. A. Armstrong, of Syracuse, .370 in 8:30; A. W. Chase, of Syracuse, .420 in 8:26; L. W. Dunning, of Syracuse, .410 in 8:17; W. P. Dowling, of Syracuse, .400 in 7:20; W. R. Jillson, of Utica, .460 in 7:14.



* * The Metropolitan Electric Street Railway Co. has been incorporated at Detroit, Mich.

* * A "telegraph school" swindle has been broken up in Boston, and the principal, one Jno. J. Hellehen, arrested.

* * A Japanese inventor claims to have made from seaweed a paper transparent enough to be substituted for window glass.

* * The Henry electric motor is being tried by the inventor and interested parties, on a short branch of the Kansas, Ft. Scott and Gulf Railway, extending from Kansas City to the fair grounds, a distance of four miles.

* * The Washburn & Moen Company, Worcester, has recently enlarged its property by the purchase of 30,000 feet of land adjoining the south side of its works. The directors have voted to adopt the weekly payment system after January 1. They employ about 3,000 hands.

* * At Ottawa, Ontario, the hearing of the evidence by the commissioner of patents in the case of the application of J. J. Ralph on behalf of the Toronto Manufacturing Company to invalidate the Edison patent, held by the Bell Telephone Company, has been postponed until December 9.

* * Electricians have already accomplished stupendous results, and the public must not be impatient for the achievement of all that has been promised or represented as probable, but a study of the progress of electrical discovery in recent years certainly justifies the faith that electricity is the force which is yet to accomplish the mightiest industrial revolution the world has ever seen.

* * Authorities in the iron trade say that the favorable conditions which appeared three months ago continue in all lines. Steel rails are still in good request, and the current price, $32 per ton, is firmly maintained. Arrangements have been made, it is said, for putting in blast several of the new furnaces along the Schuylkill that have been idle for years, as there is a good demand for pig iron. There is considerable inquiry for structural iron, and the mills are pretty actively at work. Nails are scarce on account of the strike, and have advanced ten cents a keg. Muck bars are somewhat higher at $27 and $28. Wrought iron pipes are in active demand, although it is said some manufacturers are beginning to accumulate stocks. The requirements for railroads now being constructed will, it is calculated, keep the mills pretty busy for some time to come. There are few old rails in the market, but if more should come out, they could readily be sold.

* * A telephone man of Connecticut has been elected to the Legislature. The Stamford *Advocate*, speaking of the matter, says: "In Darien the contest was of unusual interest. On the Democratic side was Commodore John Hilton, a man very popular with his party, and who had already served a term in the House of Representatives. The Republican candidate was Mr. John K. Butler, District Superintendent of the S. N. E. Telephone Co., whose business office is in Stamford, but whose residence is and has been for some years in Darien. Mr. Butler was handsomely elected, coming out with 17 majority from a contest fought out with great determination by the Darien Democracy. The result is a high endorsement of his popularity, and an unmistakable indication of the good will and friendship which his genial manner and upright behavior have won for him from all who know him. His nomination was a 'happy thought,' and his election a credit to the Republicans of Darien."

* * Commercial Agent Smith, Mayence, writes to the State Department at Washington, as follows: "The workings of the German patent law are not at all satisfactory or conducive to the interests of American patentees. The statute is very explicit in its provisions, and American inventors and patentees have the right, if they comply with its terms, to ask that the law be carried out; but I am sorry to say that it is almost impossible to get infringements punished, or even taken notice of. The law provides that the district-attorney where the infringer resides shall criminally prosecute on information furnished, but as patents and patent rights are surrounded by a multitude of technicalities, the district-attorney almost invariably refuses to proceed, or pigeon-holes the complaint. The lawyers say that he is obliged to carry out the provisions of the statute, but the general experience of patentees is that he does not do so; hence the infringer is bold and openly defies the law, and the public conclude that the law can be broken with impunity."

* * In 1882 Professor Rotondi presented to the Academy of Sciences in Turin a communication in which he recommended for commercial purposes the use of electricity for the decomposition of concentrated salt solution into caustic soda and chlorine gas. The experiments were confirmed by MM. Raudin and Bidet, and recently Professor Rotondi has renewed and completed his researches, which appear to be of eminently practical importance. With a dynamo machine and diaphragms, the saponification process is easily effected by means of sodium chloride (ordinary salt) and fat. The separation of the resultant products, glycerine, soap, and chlorine gas, offers no difficulty. No caustic soda or potash is thus required for saponification, and the process would be particularly applicable in cases where the chlorine could be at once used for bleaching textile fiber, and where sufficient water-power is at disposal. In such works bleaching and saponification operations might be carried on at night, whilst the motive power is not otherwise required. Professor Rotondi is further engaged in very interesting experiments on the extraction of metals directly from the ores by means of electricity.

* * The vocation of the waiter is imperiled, that which threatens his livelihood in the lower ranks of waiterdom being an invention styled the electric dining-table. The inventor of this machine—for it is as much a machine as a table—is a German, and, having put up one of his contrivances, he has invited all those who are interested in such matters to come and see it. On entering the room in which the electric dining-table has been erected, there is seen a double row of small, flat, desk-like tables, set back to back and divided one from another by a brass railing. The tables, or compartments, do not touch each other at the back, being separated by a raised shelf about three feet wide. On sitting down, each diner finds himself given a space of about three feet square, with a portion of the raised shelf on which to place his empty dishes, bottles, etc. On sitting down, too, the customer will notice a bill of fare and a punch like those used by railroad conductors. The bill of fare is divided into three columns—the first containing the dish, the second the price, and the third a series of blank spaces, across which are printed the directions to please "punch in this space whatever you want to order." Giving punches for a plate of soup, a steak and a glass of wine, the customer next "turns over" the bill of fare, according to a foot-note, and finds further directions to put it, when punched, in front of him and push the button to his right. He does so, an electric bell is heard tinkling in the kitchen, and then, as if by magic, the table in front of him slips noiselessly away, glides under the raised shelf and runs kitchenward. The time for filling the order elapses, and then, slipping out from under the shelf, comes the table once more, laden now with the soup, steak and wine, and settles itself in front of the customer. The bill of fare is there also, and, as the customer knows exactly what he punched and what he has eaten, he takes the bill of fare to the counter as a check, and pays the amount due.

Use of a Condenser in Telegraphy.

"That is a very important decision just rendered by Judge Wallace which allows the Baltimore and Ohio Telegraph Company to use the condenser in connection with their quadruplex system," said a Pittsburgh operator, "and I guess the Western Union Company won't be content to give up its hold on this invention until the Supreme Court of the United States has decided whether their patent does not only cover the means but the result attained.

"The condenser used in the Western Union rooms here is a box about one foot broad and two feet long, but the size is not essential. Inside it sheets of tinfoil and paraffin wax are laid in alternate layers. A condenser can be made of any required capacity, tinfoil and paraffin wax being all that is needed. When the condenser is ready for use, its capacity can be decreased or increased to the limit of its original power, of course, by the insertion or withdrawal of keys. The condenser absorbs the electricity and will hold it till tapped."

"How is the condenser applied?"

"We attach the condenser to duplex or quadruplex instruments to meet the resistance and electrostatic capacity of the wire. Now, from this instrument I am touching now, one current flies off to New York and another current goes on a wire, one pole of which is grounded, and the other connected with the layers of tinfoil in the condenser. This is what is called balancing; that is, we balance against the resistance and electrostatic capacity of the wire a wire of equal resistance and a condenser of equal capacity. The practical value of the condenser is enormous, indeed; without it duplex and quadruplex telegraphy could not be practiced.

"The inventor of the first condenser was M. Fiseau, of Paris, but the Western Union condensers are the invention of a man named Stearns. Some of the condensers in use in the Western Union office are large enough to balance wires of 4,000 miles length, but the largest that has yet been made is the one constructed by Messrs. Muirhead for duplexing the Atlantic cable, which contains 100,000 square feet of tinfoil, which is equivalent to over two acres.

"The decision rendered deprives the Western Union of the exclusive use of the condenser, and enables the Baltimore and Ohio Telegraph Company to utilize the invention of one of its own officers. The claim made by the Western Union was to cover the result without reference to the means by which it was secured."

* * Articles of incorporation of the International Railway Telegraph and Telephone Company, of New York, capital $1,000,000, have been filed at Albany. This is the Edison-Gilliland-Smith system of communicating between moving trains on the railways.

* * Last winter Senator Platt, in a vigorous speech in support of the patent laws, claimed that two-thirds of the aggregate wealth of the United States is due to patented inventions—that two-thirds of the $45,000,000,000 which represents the aggregate wealth of the United States rest solely upon the inventions, past and present, of this country.

* * District-Judge Brill, of St. Paul, Minn., has rendered the following decision against the Erie Telephone and Telegraph Company: "The execution and maintenance of telephone poles and lines of telephone in a public street is the imposition of an additional servitude upon the soil. No street can be subjected to such new use only upon just compensation by the owner of the fee. Defendant has not the right to maintain the pole in question in the street in front of plaintiff's lot; plaintiff is entitled to have the same removed and to have defendant enjoined from maintaining the same, and to recover the sum of $1 damages, with costs and disbursements." The decision will undoubtedly cause many changes in that city.

The Creil Experiments.

M. Marcel Deprez has been experimenting with two new dynamos connected through a resistance equal to that of the cable between Paris and Creil. The results are said to be satisfactory. At a sitting of the Academie des Sciences on the 26th inst., M. Marcel Deprez communicated the result of some experiments made between Creil and La Villette over a distance of fifty-eight kilometers for the electrical transmission of power. M. Deprez stated that complete success was obtained, inasmuch as he had effected the transmission of forty horse-power out of eighty over the line without the current heating the wire or the machine. The costs of the experiment were defrayed M. de Rothschild. M. Marcel Deprez's public experiments between Creil and Paris will take place in November. Two dynamos will be set in motion, and several arc-lamps lit by a current sent from Creil. As it was judged unsafe to have the earth as part of the circuit, there are two copper conductors hung 19 feet above the ground, which, to suit the somewhat exacting requirements of the telegraph office in view of the public safety, are coated with india-rubber. The resistance of the line is 120 ohms; its insulation is absolute. In the preliminary experiments which took place, the generator and receptor were placed side by side at Creil, and connected by a copper cable going to Paris and back. The generator can develop 6,000 volts and 30 amperes for 150 revolutions per minute. The force is supplied by two old locomotives, the wheels of which are replaced by fly-wheels. It is a remarkable feature of the dynamos that there are no sparks whatever at the collector, notwithstanding the high electromotive force. M. Alphonse de Rothschild has spent a large sum to enable M Duprez to apply his theories at Creil, assisted by a select staff of engineers.—*Londn E'ectrician, Oct.* 30.

TABLE OF EFFICIENCIES OF THE FRANKLIN INSTITUTE COMPETITIVE TEST OF DYNAMO-ELECTRIC MACHINES.

	Volts.	Amperes	Weight.	Total Efficiencies.				Commercial Efficiencies.				
				Full Load‡	¾ Load.	½ Load.	¼ Load.	Full Load.	¾ Load.	½ Load.	¼ Load.	
Edison, No. 4.	125	80	1,470 lbs.	94.45	93.26	89.65	83.89	88.44	87.40	83.65	76.40	
Edison, No. 5*.	125	100	2,475 lbs.	96.01	...	...	...	89.19	...	...	...	
Edison, No. 10.	125	200	4,710 lbs.	94.68	92.44	90.55	83.32	89.61	88.23	86.12	77.53	
Edison, No. 20*.	125	400	8,331 lbs.	96.65†	95.46	92.77	88.80	91.96†	91.19	88.93	83.76	
Weston, 6 M.	120	80	2,000 lbs.	94.67	96.53	94.84	89.33	87.66	90.10	89.33	82.87	
Weston, 7 M.	160	125	3,300 lbs.	96.56	96.38	94.84	90.09	89.37	90.49	89.57	84.37	
Weston, 6 W.I.	130	100	2,100 lbs.	96.20	94.06	92.89	91.64	90.85	89.22	87.32	84.07	

* Armature insulation gave way.
† Unofficial.
‡ Average of full load measurements.

** An important installation, devoted to the service of electro-therapeutics, has been put down in the Salpêtrière Hospital, at Paris, by the Maison Breguet. This consists of two Carre electrostatic machines, actuated by a Gramme dynamo placed some two hundred yards distant.

An Endorsement from Philadelphia.

Editors Electrical Review:

The manly stand taken by the ELECTRICAL REVIEW in favor of the general field of incandescent lighting, and against the grasping demands of the Edison Company, is greatly appreciated and warmly commended in this city. This is a pretty big country, and these monopolistic gentlemen are finding it out. The organization of the National Electric Light Association (which, I believe, was originated by the ELECTRICAL REVIEW) was not consented to by this company—in fact, was opposed by it—the designation of "kicker" being applied to all the gentlemen attending, comprising the best practical men engaged in electric lighting. This opposition, like that of the Mugwumps, in your State, to the Democratic ticket, resulted in an "overwhelming majority" for the other side, and the National Electric Light Association to-day is on a sound footing, with an energetic and able president and staff—an organization that is doing more good, and contains more promise of benefit to the entire electric-lighting field, than would result from a century of the selfish, dog-in-the manger policy of the company you have so pointedly criticised. We admire independence in this city, where the Bell of Liberty is made at home, and all with whom I have talked expressed themselves pleased to see that the REVIEW has more regard for the principle of right, and a square deal for all, than it has for a few dollars that its advertising columns might have received had it kept silent, or espoused the cause of a company that is trying to drive every other incandescent company out of the field, and I, for one, wish to see this brave stand sustained. H. R.

Philadelphia, Nov. 9.

P. S.—I am not interested in any incandescent company, and can express myself, therefore, free from prejudice—from the standpoint of "a man up a tree."

The Swift Electric Light Company's New Station at East Saginaw, Mich.

One of the most thoroughly built and complete lighting stations to be found in the country is that just erected by the Swift Electric Light Company, of East Saginaw, Mich., and nearly ready for occupancy. This company, which now operates 440 lights (mostly Brush) in the cities of East Saginaw, Bay City, and West Bay City, was organized June 20th, 1881, with a capital stock of $300,000, in shares of $25 each, and with headquarters at East Saginaw. The officers are: Alexander Swift, Cincinnati, president; L. T. Hubbard, Covington, Ky., vice-president, and H. L. Brintnall, of Cincinnati, treasurer and general manager. From its commencement the business of the company has steadily increased, and they found it necessary to have a larger building and increased capacity, resulting the purchase of a site 120x130 feet on which their new brick station 108 feet long by 52 wide stands. The dynamo room is 80x50 feet, testing room 20x20, and private office 16x12, with surplus room for other use. Two engines will supply the power, one 16"x30", the other 24"x48" (new) being built by Wicks Bros., East Saginaw.

Butman boilers and furnaces (all new) will be used.

In addition to this building a commodious stable has been put up in the rear for horses in the service of the company.

Altogether it is one of the finest modern plants to be found, and would well repay a visit by those contemplating such a building, could they make it convenient.

The lights of this company are distributed through the cities in which they operate on poles 40 to 60 feet high. They will also put in the U. S. system of incandescent lights as soon as they get located in their new station.

The success which this company has achieved reflects much credit on Mr. Brintnall, its efficient and popular manager. Mr. Brintnall has developed a great interest in electric-lighting, takes in all the conventions, is a young man, unmarried, but with no objections.

—— J. K. Mosser, of Allentown, Pa., is lighting his house with seventy-five Swan lamps, operated by Brush dynamos.

—— The electric-light will illuminate the immense steam conduits connecting the boiler-house at Albany with the Capitol.

—— The Steam Pump Company, Holyoke, has placed electric lights in its foundry department. The entire works are now lighted by electricity.

—— Quebec is now lighted by electricity, the motive power for the production of which is supplied by Montmorenci Falls, seven miles from the city.

—— A new central station has been put into operation at Fostoria, O. Thirty 2,000 candle-power Brush lamps are already in successful operation.

—— The Brush-Swan Electric Light Company, of Norfolk, Va., has recently put in a new 75 horse-power engine, to take the place of three smaller engines.

—— Some Pittsburgh men who looked for a leak in a natural gas-pipe, with a lantern, found the leak, and then went to the hospital. Gas appears to resent a search made for it with a light.

—— The architect of the Capitol at Washington objects to the electric lights, as they attract vast swarms of insects, swarms being found sticking to it every morning in summer. In winter, however, he is happy.

—— The two illuminants, gas and electricity, are in active dispute at Brussels, the bone of contention being the lighting of the Grand Place. The Municipal Council of Brussels are sorely perplexed, but gas will, in all probability, have to take second place.

—— Mr. W. H. O'Beirne, of the Star Iron Tower Company, Fort Wayne, has just returned from Fargo, Dakota, where he went to put in two 125-foot towers for the city. This Company have also just put up twelve towers for the Jenny Company at Peoria, and will erect eight more for the Decatur, Ill., Jenny Co.

—— The American Cotton-Seed Oil Company of Brooklyn, N. Y., which has adopted the Mather system of incandescent lighting, uses the Laurence & Herkner belting on the machinery. At the cotton mill of J. K. Wilson, Trenton, N. J., where an extensive incandescent plant is going in, this same firm supplies all the belting. They report their trade very active in the electric-lighting field, and make a belt for this purpose that gives satisfaction in every instance.

—— The Geneseo City Council were in Peoria, Ill., recently, investigating the electric light. The party consisted of J. H. Mitchell, mayor; S. J. Arnott, Christ Buell, J. W. Goss, R. Harrington, R. S. Schnubele, and P. A. Sweeney, aldermen; H A. White, superintendent of the water-works, and S. C. Campbell, city clerk. They were hospitably entertained by Mr. Joseph Smith, the efficient head and front of the Peoria electric light system. The Galesburg city council is also investigating this plant, with a view of adopting the electric light.

—— Owing to the great height of water lately in Ljusne River, in Sweden, floating has temporarily been suspended in the lower river, and picking out the logs to be drawn on land for winter sawing at Ljusne saw-mill could not, in consequence, be proceeded with, for which reason now, to make up for lost time, having first tried torches to get sufficient light at the timber booms, the electric-light has been carried from the saw-mill, and been found especially suitable, as it not only considerably lightens the labor, but also enables it to be done with greater safety.

—— In the United States Circuit Court at Pittsburgh, counsel for the Brush Electric Company, of Cleveland, O., and Charles F. Brush, filed a bill in equity against the Pittsburgh Carbon Company, limited. The Brush Company alleges in the bill of complaint that the Pittsburgh Carbon Company have been manufacturing and selling metal-plated carbons for illuminating points, which are the sole patent of Charles F. Brush, from whom the Brush Company holds exclusive rights of manufacture. The Brush Company asks for a writ of injunction to issue. A writ of subpœna has been ordered against the defendant company.

—— Mr. Wm. H. Powers, President of the Grand Rapids, Michigan, E. L. & P. Co., is gradually educating the citizens of Grand Rapids to the necessity of being well lighted, having lately received orders from the Council for 30 additional street lights. They operate the Brush system, and have also put in several Stanley incandescent lights running from the arc circuit by the Thomas cut-out, and giving good satisfaction. The management of the Company in detail devolves upon Mr. J. H. Marshall, through whose courtesy and efforts to please its success is greatly due.

—— The Brush Electric Light Company, of Rochester, N. Y., Mr. G. A. Redman, manager, are running in the county 624 arc lights and increasing rapidly, all run by water power, the source of power being two and a-half miles from the business portion of the city. There are several circuits of 55 lights, containing fifteen (15) miles of wire. Of the above number of lights 71 are run all day, 121 miles of wire being in service. The Brush people are at present erecting a new station on the east side of the river, which will be entirely fireproof, and flumes will furnish water for fifteen turbines, total, 3,000 horse-power, and will run two dynamos to each turbine. The Company own the entire Lower Genessee Falls, and furnish 1,600 horse-power to tenants.

—— At Wilmington, Del., an electric-light wire in front of Adams & Brothers store broke, and the electric current distributed itself in a shower of fiery sparks that make it look as though the store front was on fire. A clerk in the store ran out and dashed a bucket of water on the supposed fire, but only succeeded in diverting upon himself a shower of severe electric shocks that almost knocked him down. He then procured a hammer and attempted to dislodge the broken wire, but the second time he drew back his arm he struck a small boy who was crowding eagerly forward to see the fun, and broke out two of the lad's teeth. Finally the excitement was allayed by disconnecting the broken wire from the circuit, after which the break was promptly repaired.

—— Mr. John R. Markle, manager for the Edison Company in Michigan and Indiana, and a man of sterling business ability, is creating a good deal of business. Mr. Markle's headquarters are at Detroit, and during his absence the business reputation of the office is well sustained by his wife, Mrs. Markle, who is well versed in electrical science, in which she takes especial interest. Mr. Markle recently made arrangements for the services of Mr. Andrew Clunie, of Ann Arbor, who spends the most of his time in Indiana, and who is equal to the opportunities afforded for electric lighting business. It is proposed to illuminate the statue of the Blessed Virgin on the dome of this University of Notre Dame, by placing a crescent of electric lights at the base, which will have for a companion-piece an electric-light crown, producing a beautiful effect.

—— The Brush Electric Light Company and John E Ridall have filed a bill in equity against the Allegheny County Light Company, of Pittsburgh. The plaintiffs say that in 1881 defendant company and plaintiffs entered into a contract whereby the defendant was guaranteed the exclusive right in the cities of Pittsburgh and Allegheny of leasing or furnishing for the use of others, lights—such as the apparatus made by plaintiff is designed to give—and so far as necessary for such purpose, to put up lamps with all accessories, with no right in defendant to make or construct any of the apparatus, &c. The court was asked to declare this contract binding and in force, and that the defendants be enjoined from constructing or making, commutator apparatus, machinery or accessories or any part thereof which plaintiffs furnish, and that the defendant be restrained from using any other electric arc-light apparatus or carbons except those provided by plaintiff.

ELECTRIC LIGHT NEWS

—— The Cincinnati Cooperage Company is installing a seventy-five light incandescent plant on the Brush-Swan system.

——Electric light installations in Germany are about 400 in number, comprising approximately 1,500 arc and not less than 20,000 incandescent lamps.

—— The Silvey Electrical Company, of Cincinnati, lights the water tower of that city. Mr. Silvey states that he uses only a half-inch belt to run 25 incandescent and one arc lamps.

—— I. W. Colburn & Co., Fitchburg, Mass., have issued a vest pocket edition of their catalogue of machines and lamps for electric lighting. Small as the book is, it contains several useful tables for engineers.

—— The Toledo Electric Light Company is arranging to light East Toledo, twenty arc lights being required. The city council is engaged in discussing the plan of paying for the lights, whether by assessment by ward or benefit.

—— The so-called Pittsburgh Electric Company, agents of the Edison Company, are evidently much worried over the ELECTRICAL REVIEW's criticism of the attempts of the Edison Company to monopolize the incandescent field. We regret this, but don't see how it can be helped.

—— The Midland Electric Co., of Omaha, is a very lively concern for its age, having been incorporated about a year ago. They are doing a very prosperous business under the able management of Mr. Flemon Drake and his energetic superintendent, Mr. Israel Lovett, formerly of Charles Williams' factory, Boston.

—— The Board of Trustees of the Consolidated Electric Light Company (owning the Sawyer-Man patents) have selected the following named gentlemen as the officers for the ensuing year: President, Chas. H. Banes; Vice-President, H. R. Garden; Treasurer and General Manager, Henry C. Davis; Secretary, Wm. Richardson.

—— The Buckeye Electric Light Installation Company, No. 51 West Fourth street, Cincinnati, is formed for the purpose of installing electric-light plants. Cincinnati is an excellent location for an enterprise of this kind, and we hope to see the efforts of Messrs. Conway and Welsh, manager and electrician respectively, crowned with abundant success.

—— The South Chicago Gas and Electric Light Company has been incorporated; capital stock, $250,000, to manufacture gas for illuminating, heating and mechanical purposes, the incorporators being Chas. D. Hank, Augustus D. Lamb and Nelson A. McClary. Mr. Lamb states that the details of their plans are not decided upon, but they intend to establish a plant in South Chicago, and transact such business as the incorporate name of the company implies.

—— They all do it, or will before they get through. Terre Haute has just adopted the electric-light for street purposes, on a contract for three years. The system is the Thomson-Houston, which has been tried and found to work well. The arc light is steadily making its way into general use for street lighting. It is gradually relegating gas to the interior field. The latter is used more and more every year for cooking purposes. What it loses in the outdoor field it will more than gain in this way. Well regulated gas companies are becoming more and more liberal in their treatment of consumers, and are encouraging the use of gas for heating and cooking, as well as for power for machinery in a very cleanly and quiet manner, and at reasonable expense.

ELECTRICAL PATENTS

INDEX OF INVENTIONS FOR WHICH LETTERS PATENT OF THE UNITED STATES WERE GRANTED IN THE WEEK ENDING NOV. 3, 1885.

329,460 Electric switch; Hermann Lemp, Hartford, Conn., assignor to the Schuyler Electric Light Co., same place.

329,461 Electric arc lamp; Hermann Lemp, Hartford, Conn., assignor to the Schuyler Electric Light Co., same place.

329,468 Automatic fire-alarm telegraph; Morris Martin, Malden, Mass., and John C. Wilson, Boston, Mass.

329,469 Manufacturing thermostats; Morris Martin, Malden, Mass.

329,470 Thermostatic electric controlling device; Morris Martin, Malden, Mass.

329,477 Means for adjusting submarine duplex telegraphs; Alexander Muirhead, Upper Norwood, County of Surrey, England.

329,478 Electric railway signal; Henry C. Nicholson, Mount Washington, Ohio.

329,495 Burial casket; Chas. Sieber and Frederick H. Horntraeger, Waterloo, Ill.

329,510 Support for electric lights; Charles L. Travis, Minneapolis, Minn., assignor of one-half to the Minnesota Brush Electric Co., same place.

329,515 Printing telegraph; Samuel B. Van Nortwick, New York, N. Y.

329,618 Holder for incandescent lamps; Charles H. Benton, Cleveland, Ohio.

329,621 System of electrical distribution; Henry M. Byllesby, New York, N. Y.

329,646 Telephone call register; Angus S. Hibbard, Milwaukee, Wis.

329,681 Regulator for dynamo-electric machines; Wm. M. Schlesinger, Philadelphia, Pa.

329,698 Thermometric electric alarm; John Barry, New York, N. Y.

329,723 Siphon recording instrument for cables; Wm. Dickenson, Heart's Content, Newfoundland.

329,724 Electric earth battery; George F. Dieckmann, New York, N. Y., assignor of one fourth to Paul Gmehlin, same place.

329,732 Sound concentrator for telephone instruments; James Godfrey, Pittsburgh, Pa.

329,749 Means for preventing false signals on reversals in quadruplex telegraphs; Joseph W. Larish, Buffalo, N. Y., assignor to the Baltimore & Ohio Telegraph Co., Baltimore, Md.

329,768 Compound magnet; Samuel H. Parkes, Birmingham, County of Warwick, England.

329,772 Induction coil; Thomas J. Perrin, New York, assignor to the National Improved Telephone Co., New Orleans, La.

329,782 Electro-magnet armature; Josef Steiner Brooklyn, N. Y.

329,808 Electric circuit breaker; Christopher L. Burns, Bergen Point, N. J.

329,830 Electric signaling apparatus for machinery; Milton W. Grovesteen, New York, N. Y.

329,833 Apparatus for protecting structures from lightning; Chas. J. Hubbell, Washington, D. C.

329,871 Telegraph call-box; Frank B. Wood, New York, N. Y., assignor to the New Haven Clock Co.

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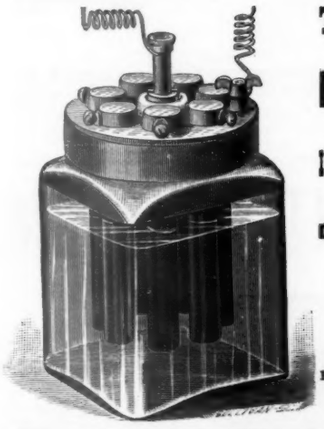

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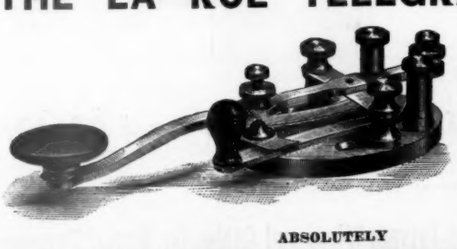

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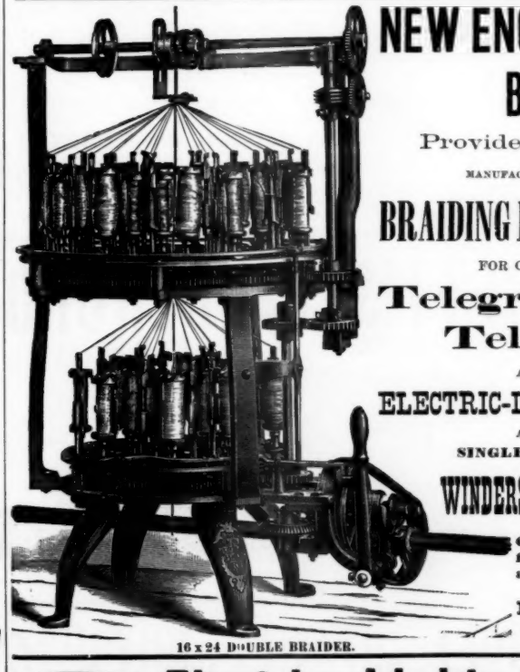

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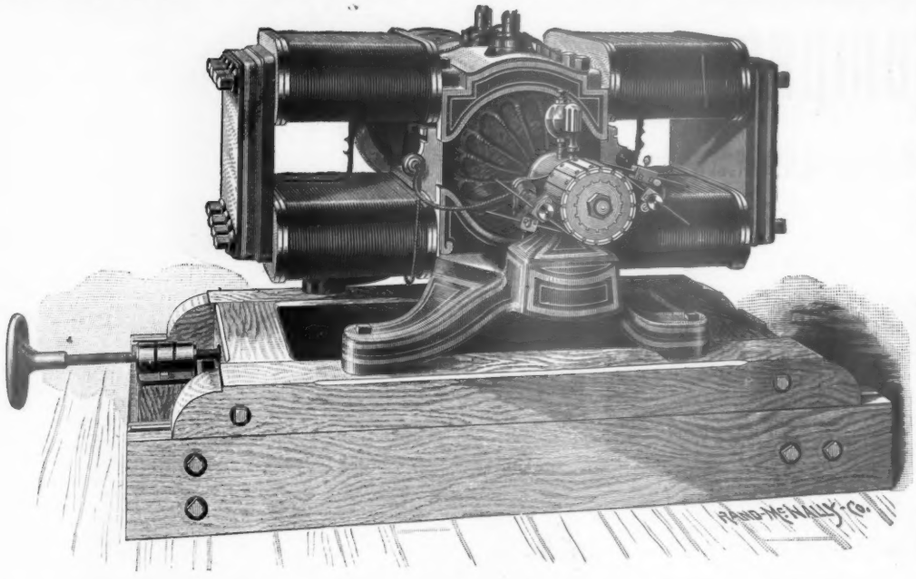

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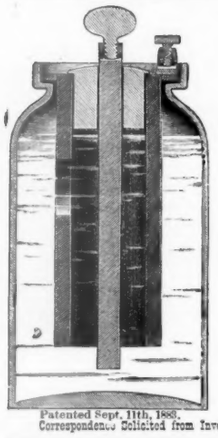

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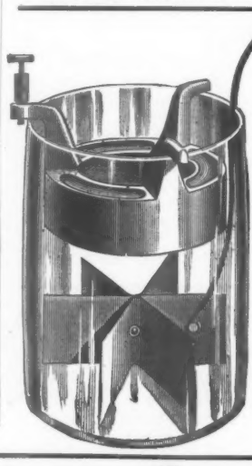

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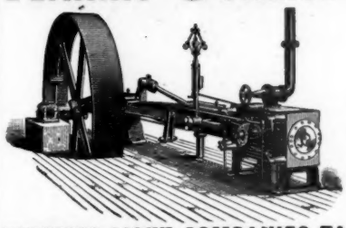

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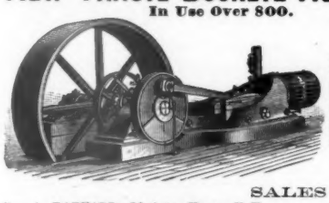

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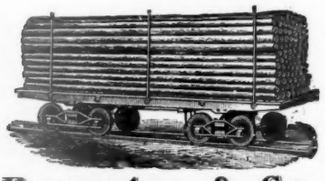

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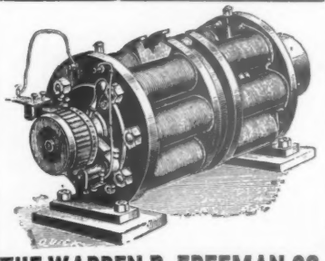

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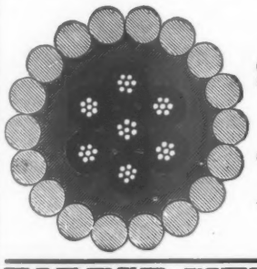

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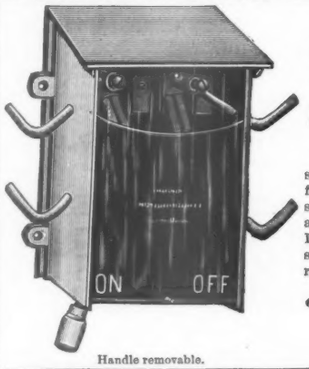

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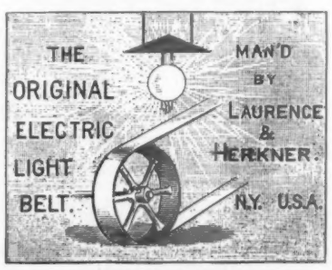

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